MAGNASCAN PLUS

Operator's Manual
6700-5740-00A

IMPORTANT

Crosfield Electronics Limited has ensured, so far as is reasonably practicable, that the Company's products are so designed and constructed as to be safe and without risk to health when properly used, and when the safety precautions contained in this document are fully observed.

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Crosfield Electronics Limited
Three Cherry Trees Lane
Hemel Hempstead
Hertfordshire HP2 7RH
England

Tel: 0442 230000
Fax: 0442 232301
Telex: 827530 CROSEL G

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WARNING

All precautions mentioned in this document must be strictly observed at all times. Personnel MUST therefore read the contents of the document BEFORE commencing any work on the equipment described in the document.

Improper use of controls and switches, failure to comply with warnings, and the performance of adjustments or procedures not specified in this document may expose personnel to danger.

Regulations and standards stipulated by the appropriate authorities in the United Kingdom are referred to throughout this document. Users in other countries must identify and comply with the regulations and standards stipulated by the equivalent authorities operating in those countries.

PREFACE

This manual describes the operation of Magnascan Plus.

ASSOCIATED DOCUMENTS

Magnascan 6X6/Sirius Scanner Pre-Installation Manual 6500-9910

Magnalink Operator's Manual 6700-5600

SUMMARY OF CONTENTS

CHAPTER 1 **INTRODUCTION**

The System, Magnascan Plus Operating Principles, Ancillary Equipment, Operator Features.

CHAPTER 2 **SAFETY REQUIREMENTS**

Health And Safety At Work, Clothing And Jewellery, Equipment And Tools, Site Safety, Mechanical Safety, Electrical Safety, Chemical Safety, Safety Labels.

CHAPTER 3 **SWITCHES CONTROLS AND INDICATORS**

Power Switches, Xenon Lamp Supply, Analyse Keyboard.

CHAPTER 4 **GENERAL OPERATING PROCEDURES**

Power-up, Power-down, Analyse Cylinder Procedures, Analyse Optics.

CHAPTER 5 **ANALYSE UNIT - PHOTOGRAPHIC PROCEDURES**

Introduction, Calibration, Position, Traverse, Enlargement And Final Size, EDG, Unsharp Masking (USM), Autobalance, Customer Values And Job Values, Luminosity Curves, Print Density, Grey Balance (GB), Black Printer, Enter White And Enter Black, Tone, Neutral Tone Boost, Colour Correction, Pastel Colour Boost, Super Pastel, Polychromatic Colour Removal, Cast, Catchlight (CL), Limit, Line Mode, Expose.

CHAPTER 6 **CARE AND MAINTENANCE**

System Care, General Care, Changing The Xenon Lamp & Top Lead, Routine Maintenance.

CHAPTER 7 **FAULTFINDING**

Faultfinding Chart, Operator Error Messages, Machine Fault Messages.

CHAPTER 8 **REFERENCE DATA**

Analyse Scanner Data, Operator's Calibration Numbers, Abbreviations.

CHAPTER 1

INTRODUCTION

CONTENTS

Section			Page
1.1	THE SYSTEM		1–1
1.2	MAGNASCAN PLUS OPERATING PRINCIPLES		1–3
	1.2.1	Analyse Cylinders	1–4
	1.2.2	Lamphouse	1–5
	1.2.3	Centre Optics Tube	1–6
	1.2.4	Analyse Head	1–7
	1.2.5	Signal Flow	1–8
1.3	ANCILLARY EQUIPMENT		1–9
	1.3.1	Transparency Viewer	1–9
	1.3.2	Loading Table	1–9
	1.3.3	Repro Pack	1–10
	1.3.4	Miscellaneous Items	1–10
1.4	OPERATOR FEATURES		1–11
	1.4.1	Polychromatic Colour Removal (PCR)	1–11
	1.4.2	Pastel Colour Boost	1–11
	1.4.3	Flexible USM	1–11

ILLUSTRATIONS

Figure		Page
1.1	The Magnascan Plus and Magnalink 1 System	1–2
1.2	Analyse Unit	1–3
1.3	Lamphouse	1–5
1.4	Analyse Head	1–7
1.5	Loading Table	1–9

TABLES

Table		Page
1.1	Miscellaneous Items Available from Crosfield	1–10

CHAPTER 1

INTRODUCTION

1.1 THE SYSTEM

Magnascan Plus is used with Magnalink to input images to desktop publishing equipment. The images are scanned directly into Colour TIFF files format. This format can be used by popular desktop retouch packages such as Adobe, Photoshop and Lettraset ColourStudio, running on an Apple Macintosh (Mac).

Figure 1.1 shows a typical Magnalink 1 system. Central to Magnalink is the Interface Unit. This sits between the scanner and the Mac and runs the software which converts between the Crosfield format and TIFF. As an image is scanned the image data is transferred over a SCSI link to the Interface Unit. Here the data is converted from Crosfield CMYB format to TIFF CMYB format and stored on disk. Once the scan is complete you can access the image file on the Mac for retouching, via Appleshare.

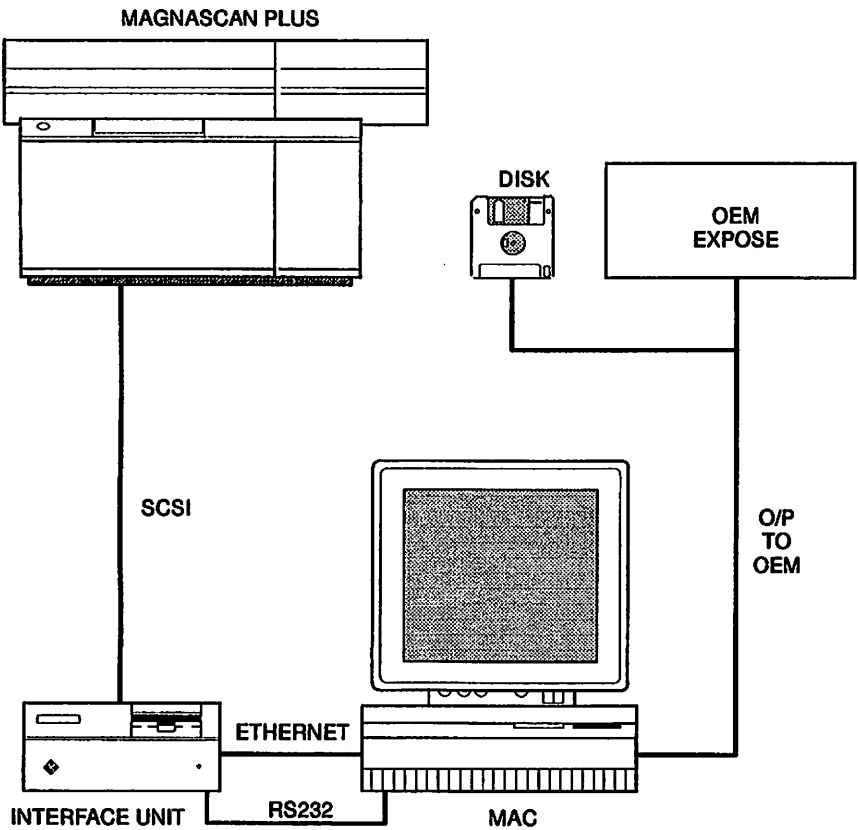


Figure 1.1 The Magnascan Plus and Magnalink 1 System

1.2 MAGNASCAN PLUS OPERATING PRINCIPLES

The analyse unit is a high-speed, high-quality colour scanning unit. Either transmission or reflection copy can be scanned on the analyse scanner to produce up to four separations per scan.

A clear Perspex cylinder, carrying the transmission or reflection copy on its surface, is rotated at constant speed by a motor. The copy is scanned by a small spot of light which moves at constant speed parallel to the axis of the cylinder. The scanning spot is produced by the analyse optical system. The carriage supports the complete analyse optics and the input electronics. The carriage is moved at constant speed for a given scan rate along a leadscrew by another motor.

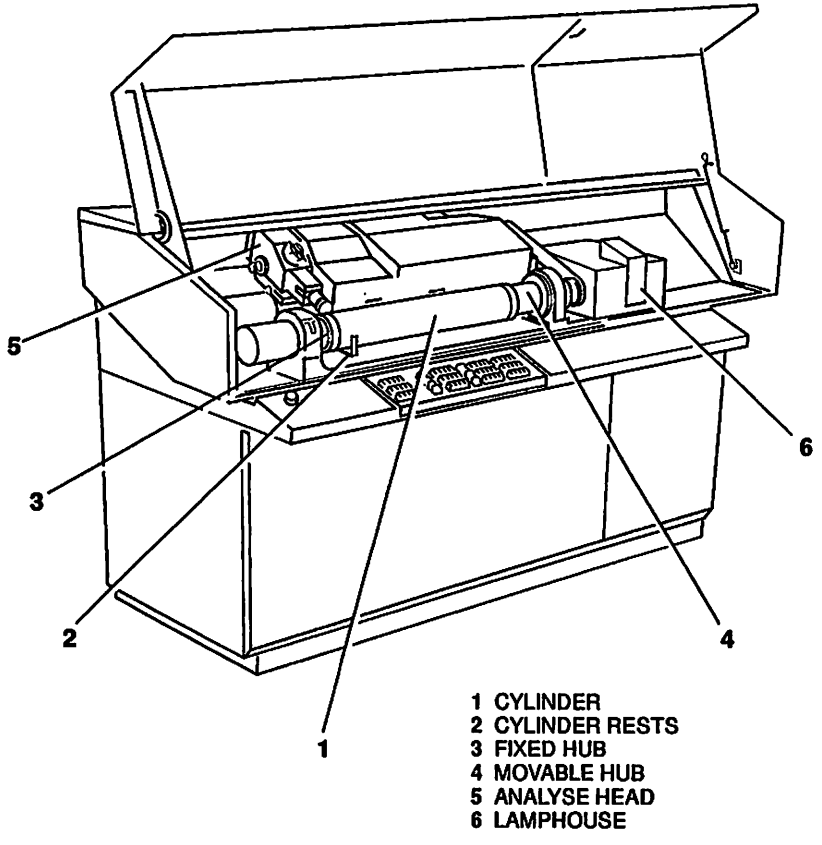


Figure 1.2 Analyse Unit

A precise servo control system enables the carriage to be traversed at a slow speed or at a fast speed in either direction. The carriage can be traversed to a pre-determined position. The limits of carriage traverse are set by micro-switches which are mounted close behind the leadscrew.

The leadscrew and cylinder run in ball bearings which are housed in bearing blocks. The bearing blocks are screwed to the cast iron beam.

The right-hand cylinder bearing block can be moved away from the other block to enable insertion or removal of the cylinder. The bearing block is moved by a toggle-lever mechanism. This mechanism is actuated by movement of the carriage near the right-hand limit of traverse. When the carriage moves in the opposite direction, the bearing block is returned to its operating position by a compression spring. The beam is supported by a strong steel frame. The covers are attached by screws or lugs to the frame. Power supplies and printed circuit boards are supported within the frame.

1.2.1 Analyse Cylinders

There are two interchangeable cylinders, one large and one small. The cylinders will take originals to a maximum size of 510 x 635 mm (large) or 510 x 317.5 mm (small) and enlargement from 20 to 2000% is possible. Copy is mounted on the cylinder using a loading table.

Each cylinder is fitted onto the cylinder hub by a small slot cut at the end of the cylinder. When a cylinder is fitted, a locating ball fitted to the left-hand hub engages the slot at that end of the cylinder.

The cylinder rests have two operating positions, one for each cylinder. In the upright position, they provide support for the smaller cylinder when loading. In the lowered position they perform the same function for the larger cylinder. The rests are mechanically linked so that raising one will raise the other.

By the left-hand hub, behind and above the centre, there is a sensor mounted in the bearing block. This sensor detects the presence of the large cylinder. If the smaller cylinder is fitted the machine will not release it unless the cylinder rests are upright. Similarly, if no cylinder is fitted, the carriage will not traverse unless the cylinder rests are upright. If you want to traverse the carriage in order to change the centre optics lens, raise the cylinder rests.

The cylinder cannot be released accidentally whilst it is rotating.

1.2.2 Lamphouse

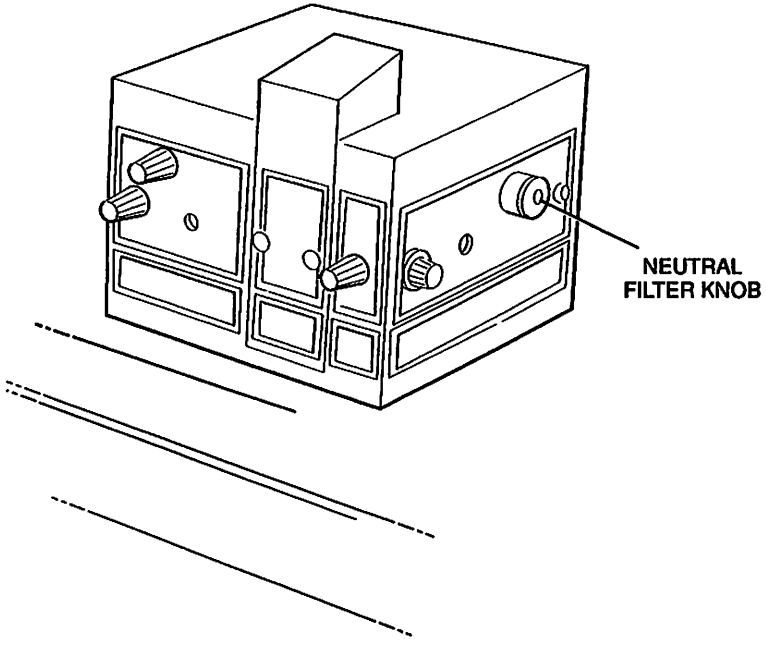


Figure 1.3 Lamphouse

The rectangular box at the right-hand end of the analyse unit contains the xenon lamp. This is a stabilized 150 W xenon lamp which emits an intense white light. Safety precautions must be taken before changing the lamp. For greater stability the lamp is best left switched on as much as possible, e.g. overnight and at weekends.

The analyse photomultipliers are balanced to ensure neutrality of neutral input.

Lenses, prisms, mirrors and beamsplitters produce three light beams for use in:

1. Scanning transmission copy
2. Scanning reflection copy
3. Viewing transmission copy.

The required beam is selected by movement of vanes or mirrors, attached to solenoids.

The **transmission copy** beam travels from the lamphouse, along the centre optics tube to a prism at the end. The prism reflects the beam through 90° so that it passes through the perspex analyse cylinder and the transparency. Knobs at the right-hand side of the lamphouse provide adjustments for the transmission copy beam. A neutral filter selection knob is located at the right-hand side of the lamphouse. The neutral density filters are used in conjunction with apertures in the analyse head so as to maintain the required light levels on the photomultipliers.

The **reflection copy** beam travels along a fibre optics light guide which splits into three light guides. The guides are fixed at their ends so that the three light beams converge to produce a fine spot of light on the reflection copy. This arrangement avoids direct reflection of light from the reflection copy into the analyse lens. Knobs at the left-hand side of the lamphouse provide adjustments for the reflection copy beam.

The **viewing** beam travels along a perspex light guide to a diffuser at the end of the centre optics tube. This results in a general illumination of the transmission copy.

1.2.3 Centre Optics Tube

The centre optics tube moves to and fro inside the analyse cylinder, when the carriage traverse. There are two centre optics lenses, (scanning lenses), one for the large cylinder, the other for the small cylinder. The centre optics lens focuses a fine spot of light onto the transparency. The required lens is plugged into the end of the tube, except for scanning reflection copy. In this case a blanking plug is used to prevent unwanted transmission of light through the copy.

The centre optics tube provides illumination for a transparency. When the View mode is selected the centre optics tube provides background illumination at a reduced intensity. This enables viewing the transparency, over a larger area than is used for scanning.

1.2.4 Analyse Head

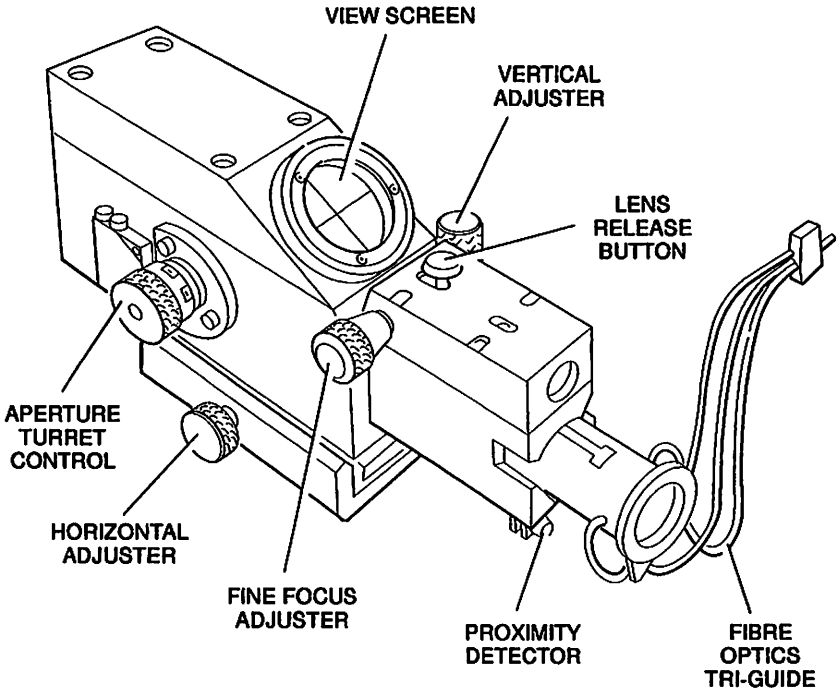


Figure 1.4 Analyse Head

The illuminated spot on the original is at the focus of the analyse lens, which is mounted in the analyse head. Light passes through this lens and is reflected through 90° by a prism onto the dichroic assembly. The dichroic assembly separates the red, green and blue components of the light, and reflects these onto three photomultipliers.

The analyse head is the scanning eye of the analyse unit. The analyse lens is mounted in a metal tube which can be set in two positions, to suit the analyse cylinder in use. Fixed to the lens mounting is a focus control to adjust the focus of the lens at two positions.

The knob on the top of the analyse head, and the one on the front left-hand side of the head are centering controls, used to align the head with the light coming through the transparency.

The aperture knob, at the rear left-hand side of the analyse head, is used to select the correct size of scanning light spot to suit the enlargement required.

When the View mode is selected, a movable mirror reflects a magnified image of the scanned area of the original onto a ground glass screen.

1.2.5 Signal Flow

Each photomultiplier produces a small electric current which is proportional to the amount of red, green or blue light falling on it. Electronic circuits convert these currents to three digital signals, which represent the cyan, magenta and yellow components of the light. The digital signals are processed by other electronic circuits as required for detail enhancement, under-colour removal, colour correction, etc..

The fully processed digital signals pass along a cable to the host disk.

1.3 ANCILLARY EQUIPMENT

1.3.1 Transparency Viewer

The transparency viewer, is a light-box which may be wall-mounted to facilitate the examination of transparencies and separations. A sheet of opal glass is evenly illuminated by fluorescent tubes which are mounted inside the box. For correct assessment of colour transparencies, the light source should have a colour temperature of 5,000°K. Tubes of incorrect type or old tubes may cause errors of judgement.

1.3.2 Loading Table

Both transparencies and stripped reflection copy are mounted on cylinders using the loading table (7503-2420). The loading table should be fitted over a light table so that cylinders and transparencies may be illuminated from below. The rollers are kept on a storage shaft that fits in grooves at the back of the mounting table, next to the grooves for the roller shaft.

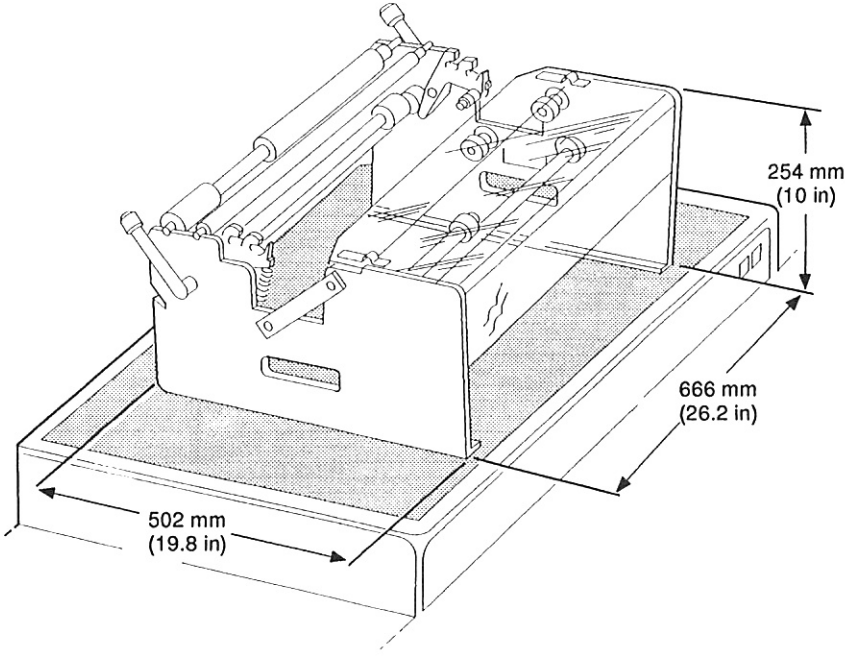


Figure 1.5 Loading Table

1.3.3 Repro Pack

The Repro Pack is a folder containing transmission and reflection copy subjects, grey scales, etc.. The Pack is designed for use as a standard for scanner reproduction. Instructions for use are included in the Pack.

1.3.4 Miscellaneous Items

An Operator's Pack is supplied with each scanner. It consists of tools, safety equipment and consumable items. These items can be ordered separately from Crosfield and have been listed with part numbers in Table 1.1.

The table includes several additional items which are not supplied with the Operator's Pack. Those items marked with an * are available from Crosfield but are subject to fire regulations and cannot be sent by air.

Table 1.1 Miscellaneous Items Available from Crosfield

Description	Part No.
Printed Rule	P5511-4280
Xenon Lamp, Top Lead Assy	P7503-0940
Cyl Cleaning Tool	P7503-2410
Can Of Maccurat 32 Oil	P7503-6170
Pl, X/Lamp, 150 W	P7513-8540
Feint Ruled Book, 10 x 8	P9900-0006
Sellotape, Transparent	P9900-0147
Fuse 3A, 6.3x32 mm, F/Act	P9928-5068
Hexagon Allen Key	P9990-3411
6inch Slip Joint Pliers	P9990-4013
Static Master	P9990-5090
Oil Can with Brass Spout	P9990-5545
Petroleum Jelly	P9996-2068
Sellotape Dispenser	P9996-4096
Tissues, 150 Sheets x 2 Ply	P9996-5080
Cotton Buds	P9998-5082
Head Band	P9998-9349
Clear Visor	P9998-9354
Gauntlets, AA/5C	P9998-9402
Optics Cleaning Fluid *	P7504-9670
Anti-Static Cleaner *	P9996-2511
Anchor Film Cleaner *	P9996-3041
Liquid Paraffin *	P9996-4088
Bottle Eye Dropper *	P9998-9065

1.4 OPERATOR FEATURES

The Magnascan software provides the user with a broad range of facilities, which are dealt with fully in Chapters 4 and 5. Features of particular interest are highlighted in this section.

1.4.1 Polychromatic Colour Removal (PCR)

This function enables separations to be provided by the scanner whereby the third colour content is replaced by black. All predicted densities and dot percentages are shown in the normal 4-colour mode. The amount of 'clean out' of the third colour can be adjusted and a black compensation term is provided as in the normal UCR function. The PCR function is called for only when scanning.

1.4.2 Pastel Colour Boost

This function enables non-saturated colours to have extra colour correction applied to them. The pastel colour boost function controls the degree of boost and also the density point of the peak boost value. It is also possible to apply pastel correction colour selectively.

1.4.3 Flexible USM

USM facilities include the following items:

1. A smoothing control for areas of low detail contrast and also for areas of high density.
2. A facility enabling any three 'fringe' signals to be applied to any of the colour channels, including the black channel, to improve the appearance of an original. For example, a magenta fringe applied to the cyan colour channel improves the appearance of a flat 'blue sky' type of original.
3. Control over fringe characteristics, which allow a sharpness fringe to be generated on the black printer.

CHAPTER 2

SAFETY REQUIREMENTS

CONTENTS

Section		Page
2.1	HEALTH AND SAFETY AT WORK	2-1
	2.1.1 Warnings and Cautions	2-1
2.2	CLOTHING AND JEWELLERY	2-1
2.3	EQUIPMENT AND TOOLS	2-2
2.4	SITE SAFETY	2-2
	2.4.1 Safety Devices	2-2
	2.4.2 Attending Equipment	2-2
2.5	MECHANICAL SAFETY	2-2
2.6	ELECTRICAL SAFETY	2-3
2.7	CHEMICAL SAFETY	2-3
2.8	SAFETY LABELS	2-4
	2.8.1 Analyse Unit	2-4

ILLUSTRATIONS

Figure		Page
2.1	Safety Label on Analyse Unit, Left Lid	2-5
2.2	Safety Label on Analyse Unit, Right Lid	2-6
2.3	Safety Labels on the Analyse Unit, Remote Diagnostics Tray	2-7

CHAPTER 2

SAFETY REQUIREMENTS

2.1 HEALTH AND SAFETY AT WORK

All personnel are advised to familiarize themselves with any local or national legislation relating to health and safety at work. Particular attention should be given to those sections covering personal responsibility regarding safe working practices which must be strictly observed at all times.

This chapter explains the safety conventions used in this manual and highlights safety practices specific to this equipment.

2.1.1 Warnings and Cautions

There are two safety categories, namely WARNINGS and CAUTIONS.

1. WARNINGS are given for conditions which may endanger the safety of personnel.

WARNING

The instructions given in warnings must be followed precisely. They are given to avoid injury or death.

2. CAUTIONS are given for conditions which may cause damage to equipment or materials.

CAUTION

The instructions given in cautions must be followed to avoid damage to equipment or materials.

2.2 CLOTHING AND JEWELLERY

Do not wear clothing or jewellery which could be hazardous when in contact with any part of the equipment, or which could reflect laser light into an eye.

2.3 EQUIPMENT AND TOOLS

Use the tools and wear the protective clothing as may be recommended.

2.4 SITE SAFETY

2.4.1 Safety Devices

Ensure that all safety controls, such as brakes, interlocks, circuit brakes, indicators, covers, guards and warnings labels are present and functioning correctly, before handing over the equipment to the customer.

Unless essential for commissioning or servicing and under prescribed conditions, never override, negate or otherwise bypass safety controls, such as brakes, interlocks, circuit breakers, indicators, covers and guards.

2.4.2 Attending Equipment

Never leave equipment unattended unless in a safe condition with respect to mechanical, optical, chemical, electrical or other hazards.

2.5 MECHANICAL SAFETY

The following basic precautions apply to the system, and also to the equipment with which it is used.

- Do not attempt to lift heavy equipment on your own. Obtain assistance from able-bodied persons or use suitable equipment as instructed in the manual.
- Always close equipment doors and access panels to prevent anyone colliding with them.
- Avoid leaving electrical cables trailing where anyone may trip over them.
- Make sure that mechanical servicing is undertaken only by properly authorized personnel.

WARNING

If both scanner lids are open and the left-hand lid is closed, the right-hand (pod) lid will close unaided, causing possible injury.

2.6 ELECTRICAL SAFETY

- Check mains cables regularly to ensure that they are not worn or damaged.
- Ensure that water and other liquids do not come into contact with the equipment.
- Do not attempt to operate the equipment when flammable or volatile substances are present in the atmosphere.
- Ensure that the correct type of fire extinguishers (BCF or CO_2) are present in the operating areas, and that they are regularly serviced.
- Ensure that electrical servicing is undertaken only by properly authorized personnel.

2.7 CHEMICAL SAFETY

The following guidelines must be followed when storing or handling highly flammable liquids.

- Store bulk supplies in a metal cabinet marked with a 'flammable liquid' label of an approved design.
- For use in the work area, decant the liquid to a container with a maximum capacity of 250 cc. The use of a safety dispenser is recommended.
- Do not use the liquid near to non-flame proofed electrical equipment.
- Do not use the liquid near to a naked flame. DO NOT SMOKE.
- Avoid skin contact. Wear protective gloves.
- Avoid contact with eyes. Wear goggles.
- Use only in a well ventilated area.

2.8 SAFETY LABELS

Safety labels are fitted to the equipment to warn you of potential hazards. These labels must not be defaced or removed.

Safety labels which can be seen when the equipment is installed and operational are listed in the following sections.

2.8.1 Analyse Unit

A label is fitted to the left-hand lid, (see Figure 2.1). It warns that the left-hand lid (cover) must be closed before a scan sequence is started.

A label is also fitted to the right-hand lid, (see Figure 2.2). It warns that the right-hand lid closes automatically when the left-hand lid is closed.

Analyse units fitted with remote diagnostics have two labels fitted to the front panel of the remote diagnostics tray, (see Figure 2.3). One label describes the safety procedures required when the scanner is handed over to the control of a remote terminal. The other warns of extra high tension.

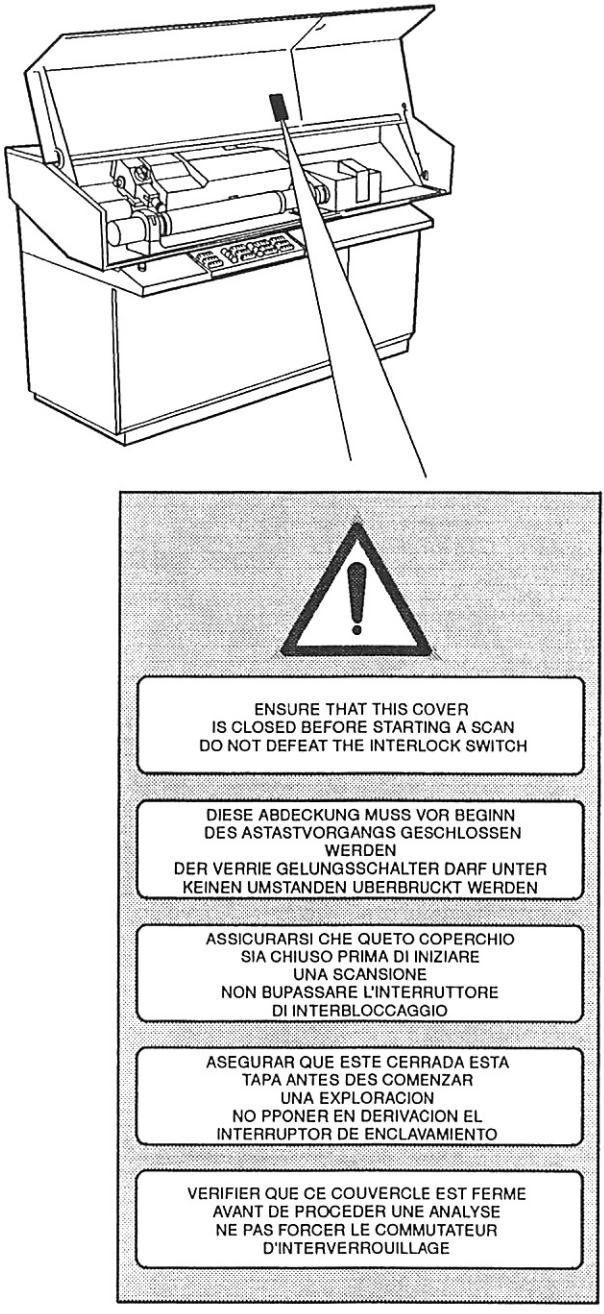


Figure 2.1 Safety Label on Analyse Unit, Left Lid

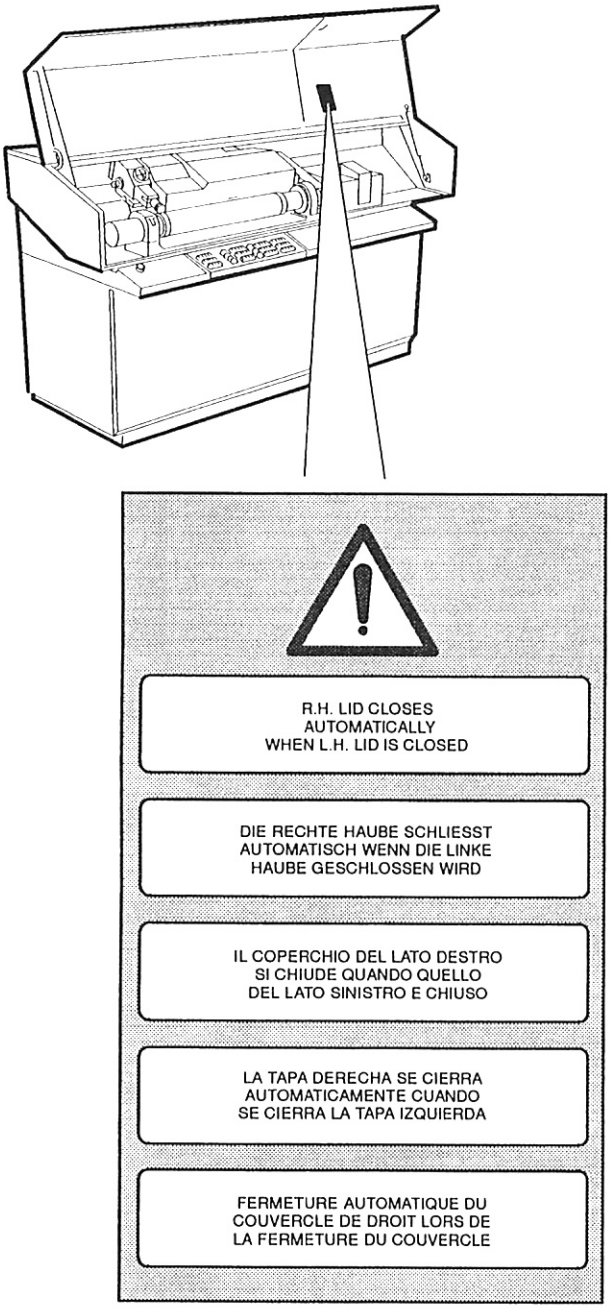


Figure 2.2 Safety Label on Analyse Unit, Right Lid

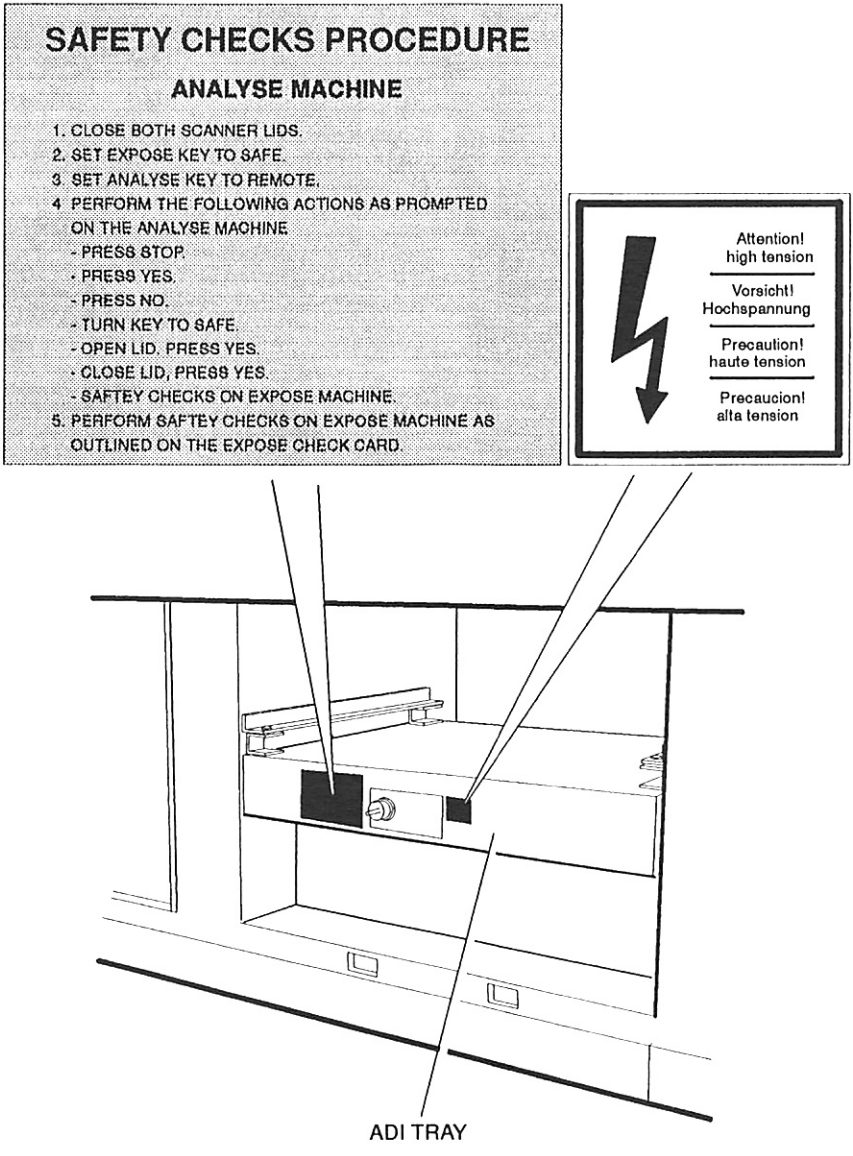

SAFETY CHECKS PROCEDURE
ANALYSE MACHINE
1. CLOSE BOTH SCANNER LIDS.
2. SET EXPOSE KEY TO SAFE.
3. SET ANALYSE KEY TO REMOTE.
4. PERFORM THE FOLLOWING ACTIONS AS PROMPTED ON THE ANALYSE MACHINE
- PRESS STOP.
- PRESS YES.
- PRESS NO.
- TURN KEY TO SAFE.
- OPEN LID, PRESS YES.
- CLOSE LID, PRESS YES.
- SAFTEY CHECKS ON EXPOSE MACHINE.
5. PERFORM SAFTEY CHECKS ON EXPOSE MACHINE AS OUTLINED ON THE EXPOSE CHECK CARD.
Attention! high tension
Vorsicht! Hochspannung
Precaution! haute tension
Precaucion! alta tension
ADI TRAY

Figure 2.3 Safety Labels on the Analyse Unit, Remote Diagnostics Tray

CHAPTER 3

SWITCHES CONTROLS AND INDICATORS

CONTENTS

Section			Page
3.1	POWER SWITCHES		3–1
3.2	XENON LAMP SUPPLY		3–2
3.3	ANALYSE KEYBOARD		3–3
	3.3.1	Keyboard Displays	3–4
	3.3.2	Operator Control Buttons	3–5
	3.3.3	Channel Select Buttons	3–7
	3.3.4	Keypad Buttons	3–7
	3.3.5	Editorial Controls	3–8
	3.3.6	Scanner Controls	3–14

ILLUSTRATIONS

Figure		Page
3.1	Control Panel Switches, Analyse Unit	3–1
3.2	Analyse Keyboard	3–3
3.3	Analyse Keyboard Displays	3–4
3.4	Operator Control Buttons	3–5
3.5	Channel Select Buttons and Keypad	3–7
3.6	Editorial Control Buttons	3–8
3.7	Scanner Control Buttons	3–14

CHAPTER 3

SWITCHES CONTROLS AND INDICATORS

3.1 POWER SWITCHES

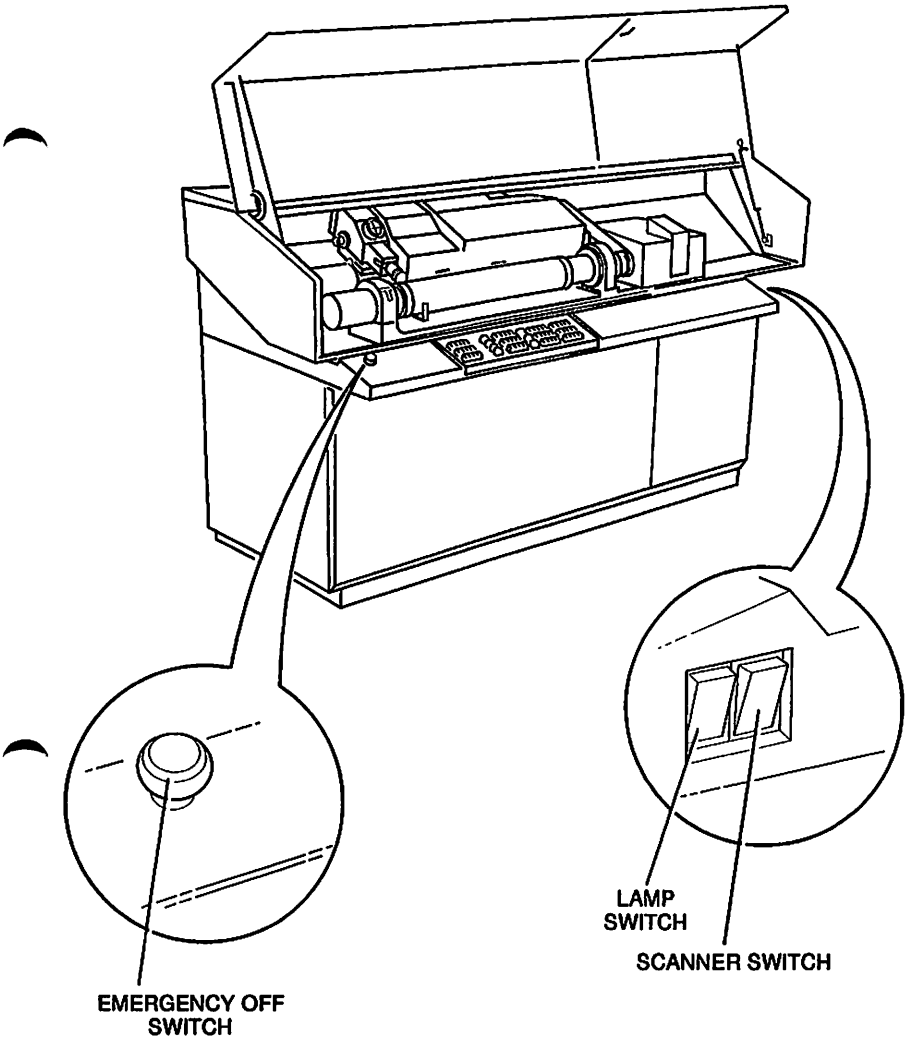


Figure 3.1 Control Panel Switches, Analyse Unit

The control panel carries three power switches and the keyboard, (see Figure 3.1). The **LAMP** and **SCANNER** switches are recessed in the panel side.

The Emergency - Off switch is at the left-hand end of the control panel. It removes all electric power from the analyse unit when it is pressed.

CAUTION

The cylinder will continue to rotate under its own momentum after the power has been removed and sufficient time should be allowed for the cylinder to come to rest before opening the lid of the unit.

The **SCANNER** switch controls the power to all the circuits in the analyse unit except the lamp power supply and the cooling fans.

The **LAMP** switch controls the power to the lamp power supply and the cooling fans.

For power-up procedures, (see Chapter 4).

3.2 XENON LAMP SUPPLY

Removal of the left-hand front panel from the scanner will reveal the xenon lamp supply (XLS). The front panel of the XLS carries the push button used in starting the lamp, (see Figure 4.1).

3.3 ANALYSE KEYBOARD

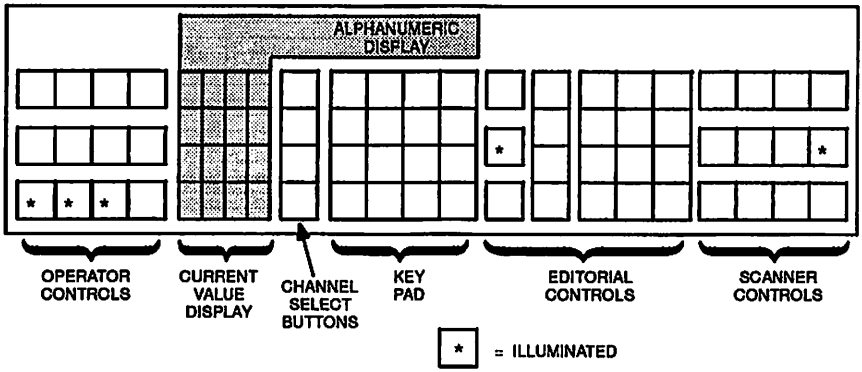


Figure 3.2 Analyse Keyboard

The keyboard carries two displays and a number of pushbuttons arranged in groups. The displays are the Alphanumeric Display and the Current Value Display. The groups of buttons are listed as follows:

Operator Control Buttons

Channel Select Buttons

Keypad Buttons

Editorial Control Buttons

Scanner Control Buttons.

The groups of pushbuttons are named in Figure 3.2. Some of the buttons have more than one function. Each button and display is described in the following text. For a full description of how they are used, in what sequences and for what purposes, (see Chapter 5).

When working under dark-room conditions it is important to turn off any panel-button lights. Enter **[CAL] 0** and press **[ENTER]**. The lights are turned off.

Single Bleep

A short bleep is sounded whenever a keyboard button is pressed to call attention to the displays. This is usually performed in response to an operation, but sometimes the scanner performs a sequence of operations by itself. In that case, it monitors the progress of the sequence by means of displayed messages and gives a bleep for each message.

Sometimes the bleep accompanies an error message.

Double Bleep

A double bleep is given if the wrong type of data is entered in PCR and/or Output Cal entries, i.e. density values instead of dot % values.

Triple Bleep

The triple bleep is a warning.

Sometimes a failure occurs in the machine, a failure message is displayed and three bleeps sound.

Sometimes the operator may attempt an operation that is not allowed. The machine will not understand what is required. It will do nothing, except give three bleeps.

The third case occurs when the machine is unable to autobalance. It will display a message to that effect and give three bleeps.

3.3.1 Keyboard Displays

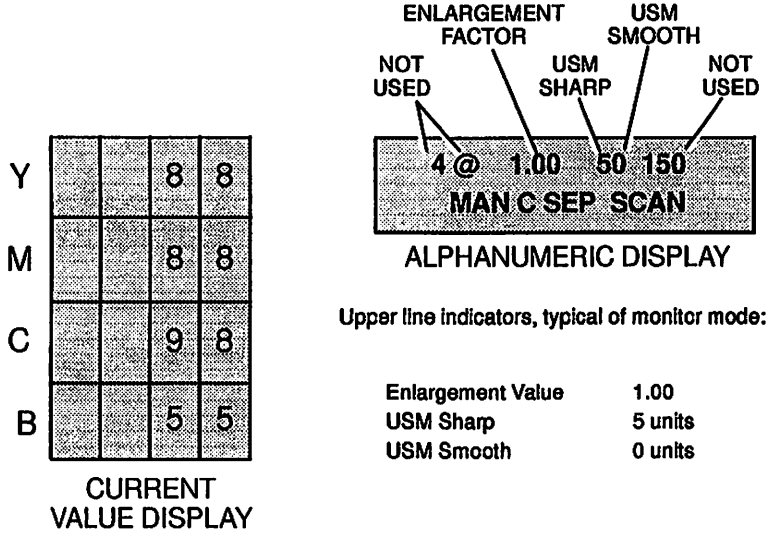


Figure 3.3 Analyse Keyboard Displays

The Alphanumeric Display (see Figure 3.3) shows the current state of the scanner or asks questions about entries that you may want to make. It will also display error messages.

The Current Value Display has one channel for each of the four printers, Yellow, Magenta, Cyan and Black. It displays values of original density if **[ORIG]** is pressed, or separation dot % if **[SEP]** is pressed. The values, which are those for the area of the original or cylinder that would be seen in the centre of the View screen, are displayed in the four channels simultaneously.

3.3.2 Operator Control Buttons

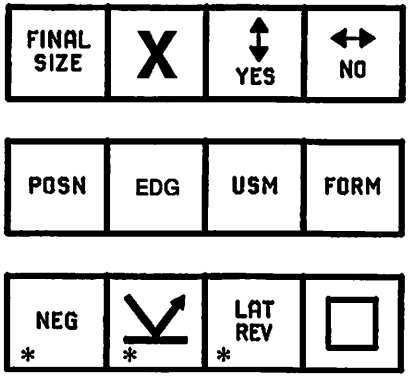


Figure 3.4 Operator Control Buttons

These buttons allow the operator to select facilities that affect the quality of the picture to be produced. Use of the buttons in conjunction with the keypad will cause the Alphanumeric Display to change.

The **[FINAL SIZE]** button is used to enter the required separation size. The scanner will then calculate the enlargement value needed. Alternatively, this button can be used to enter the existing original size and what enlargement value is required.

The Enlargement button is used with the keypad to enter a required enlargement value. When **[FINAL SIZE]** is pressed, the scanner will calculate and display the separation size.

This button is used for two functions:

- To give affirmative answers to questions shown on the Alphanumeric Display.
- To select vertical dimensions with **[FINAL SIZE]**.

This button is used for two functions:

- To give negative answers to questions shown on the Alphanumeric Display.
- To select horizontal dimensions in conjunction with **[FINAL SIZE]**.

The **[POSN]** button is used to enter the Start position of the picture. It is used in conjunction with the analyse head.

The **[EDG]** button is used to select the scanning resolution.

The Unsharp Masking button, **[USM]**, is used to select and display the required levels of USM, USM Sharp and USM Smooth.

This button is used to select reflection or transmission mode of operation.

* Illuminated	=	reflection mode
Not illuminated	=	transmission mode.

The Lateral Reversal button, **[LAT REV]** is used to select the direction in which the analyse carriage moves when scanning.

* Illuminated	=	right to left
Not Illuminated	=	left to right.

When the button is **not** illuminated, a transparency that is mounted wrong reading, emulsion-up, will be scanned to give a separation which, when viewed emulsion-up, will be wrong reading. This is the normal mode of operation for Offset Litho.

This button is not used.

Line mode is now selected using **[CAL] 509**.

3.3.3 Channel Select Buttons

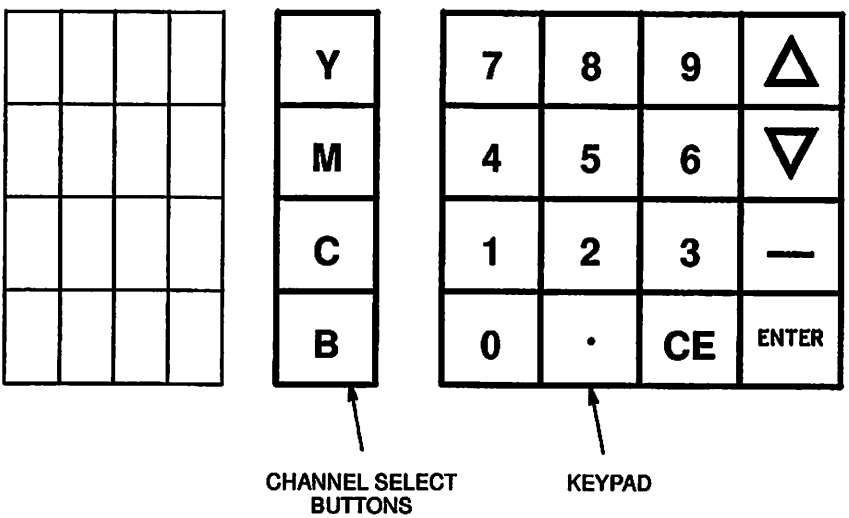


Figure 3.5 Channel Select Buttons and Keypad

These four buttons are coloured to correspond to the colour of the printers, Yellow, Magenta, Cyan and Black. The buttons are selected individually so that you can enter reproduction characteristics for an individual channel.

3.3.4 Keypad Buttons

All the buttons from 0 to 9, together with the decimal point and the minus sign, are used to enter numerical data into the scanner.

Increase/
Step Backward

Decrease/
Step forward

These buttons may be used to increase or decrease the effect of a selected Edit function, raising or lowering the Index number of that Edit function.

They may also be used to step through the output functions sequence, as indicated.

The **[CE]** button is used to cancel any entry that has been selected by means of the keypad, provided that **[ENTER]** has **not** been pressed.

The **[ENTER]** button is used to enter any data into the scanner. A successful entry is indicated by **one** bleep.

3.3.5 Editorial Controls

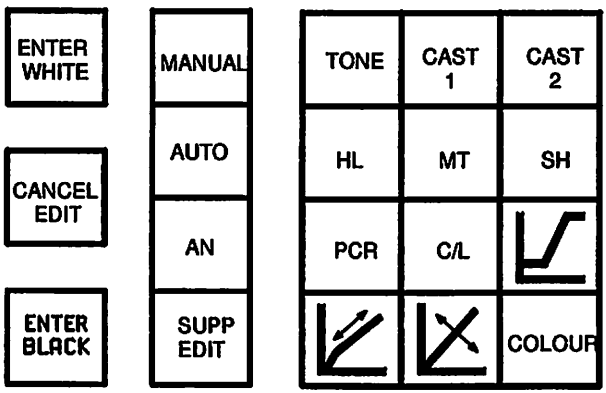


Figure 3.6 Editorial Control Buttons

End Densities

[ENTER WHITE], **[ENTER BLACK]**, **[MANUAL]**, **[AUTO]** and the Auto Neutral key, **[AN]**, are used to set the Highlight and Shadow starting points. The picture processing will be based on these two points. The scanner will determine the required tonal gradation between these points, according to instructions from the operator.

The **[ENTER WHITE]** button is used to enter the first printing tone.

The **[ENTER BLACK]** button is used to enter shadow areas. Where there are no shadows, you can enter saturated colours.

Note: Enter White (EW) and Enter Black (EB) functions must be set **before** the editorial non-facsimile controls are used.

[MANUAL], **[AUTO]** and **[AN]** select the way in which you wish to use EW and/or EB.

The **[MANUAL]** button is used to enter an individual value for EW and/or EB in any of the three colour channels. The values in the other channels and the Black Printer will be adjusted automatically to give scanner facsimile at that entry point.

The **[AUTO]** button is used to enter preset values for EW and/or EB without needing to select a colour channel.

1. Highlight

   Press **[AUTO]** followed by **[ENTER WHITE]**. The scanner automatically puts a preset value in the lowest channel and adjusts the other channels to give proportional values. This will give partial neutralization of any cast.

2. Shadow

   Press **[AUTO]** followed by **[ENTER BLACK]**. The scanner automatically puts a preset value in the highest channel and adjusts the other channels proportionally.

The Auto-Neutral **[AN]** button is used to enter preset values for EW and/or EB that will give a completely neutralized set of values for the three colour channels. There is no need to select a particular channel.

1. Highlight

   For a transparency with a cast in the highlight which should print as a neutral, use **[AN]** with EW.

2. Shadow

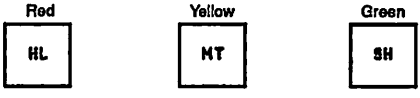
   The shadow of a transparency that is not neutral may appear to be Dark Brown or Dark Green or Dark Blue. To make the shadow neutral, use **[AN]**. Do **not** use **[AN]** to remove an overall cast.

Note: Enter White and Enter Black must be set before these buttons are used. **[CAST 2]** must always be selected before **[CAST 1]**.

Tone and Cast Buttons

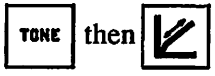
The **[TONE]** button is effective simultaneously in all channels. **[CAST 1]** is effective in individual channels and not neutral selective. **[CAST 2]** is neutral selective in the shadows only.

Pressing **[TONE]**, **[CAST 1]** or **[CAST 2]** a second time will take you out of that particular Edit mode.



The **[HL]**, **[MT]** and **[SH]** buttons are used to control highlight, midtone and shadow gradations respectively. Any one of these may be used after **[TONE]** or **[CAST 1]**.

The **[TONE]** button is used to make equal and simultaneous adjustments of the curves in all three colour channels, in Highlights and/or Mid Tones and/or Shadows, thus making particular parts of a transparency heavier or lighter while still maintaining inter-channel difference.



: Enables Neutral Tone function

[CAST 2] must always be selected before **[CAST 1]**.

The **[CAST 2]** button differs from **[CAST 1]**.

- It is NEUTRAL SELECTIVE, i.e. has full effect on neutrals in the subject with no effect on saturated colours;
- It is only effective in Shadows (the **[SH]** button does not require selection).

The **[CAST 1]** button is used in:

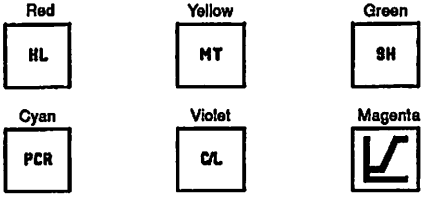
- a) the Highlight and/or Mid Tone and/or Shadow areas
- b) the C and/or Y and/or M channels.

Cast can be corrected in one or two colour channels, e.g. in order to make an area neutral. However, cast correction can be made in all three colour channels if required.

The Cast 1 function must be applied after the Cast 2 function.

Note: This button affects neutrals and colours alike and is therefore NOT NEUTRAL SELECTIVE.

Colour Correction Buttons



These coloured buttons have dual functions and will only work as colour correction (CC) controls if the CC facility has been selected beforehand by pressing **[COLOUR]**. Otherwise, they operate according to the functions marked on their faces. The CC buttons are used to select colours in the original to be corrected.

If a direct entry CC is attempted but is not acceptable (e.g. monitoring a blue area and trying to use the red button in the C channel) an error message will appear on the Alphanumeric Display. This applies to direct entry of dot % values but not to the use of the Increase and Decrease buttons,

i.e. and respectively.

Colour

The **[COLOUR]** button is used to access the CC controls.

Press **[COLOUR]** again to exit from the CC mode.

Polychromatic Colour Removal

The **[PCR]** button is used to access the Polychromatic Colour Removal (PCR) facility.

Catchlight

The Catchlight button **[C/L]**, is used to get a highlight drop-out facility with variable Slope.

The Catchlight (CL) must be set using Breakpoint and Slope facilities.

Breakpoint

This button is used in the Breakpoint setting sequences for PCR and CL to interrogate the current settings.

then : Enables pastel functions

Slope

This button is used in the Slope setting sequence for PCR and CL to interrogate the current settings.

Limits

This button is used to set dot % limits. This has the effect of cutting off the tones in a scanned film at a certain dot %. It is normally used for a specific printing process.

Note: The Limits function should not be confused with Highlight Catchlight control or Shadow PCR control.

Edit Buttons

The **[CANCEL EDIT]** button lights up when Edit functions have been selected or entered into the scanner provided that the last used CV and JV are not equal. **[MANUAL] [ENTER WHITE], [MANUAL] [ENTER BLACK]** and **[AUTO] [ENTER BLACK] do not** cause the button to light up.

If the **[CANCEL EDIT]** button is pressed, the scanner display asks if you wish to cancel all the Edit functions (Colour, Tone, Cast 1, Cast 2, PCR, Catchlight, Limits, Black, Pastel Boost).

- Press **[YES]** if you do. The scanner bleeps once, cancels all edits and returns to the monitor mode.

- Press **[NO]** if you don't. The scanner asks if you wish to cancel the first Edit function. It repeats this for each function in turn, stepping through them as **[YES]** or **[NO]** are pressed.

The **[SUPP EDIT]** button is used to see what effect an Edit control is having.

- a) Select the Edit function and press **[SUPP EDIT]**. This will suppress the Edit that has been made and show you the value before the Edit was applied.
- b) If no Edit is in use, **[SUPP EDIT]** displays CV without Grey Balance (GB). If an Edit function is in use and its effects are to be displayed without GB, exit from the Edit function, press **[SUPP EDIT]**.

3.3.6 Scanner Controls

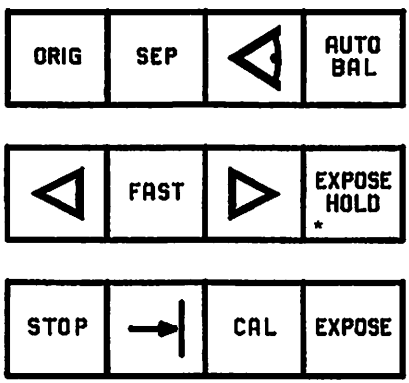


Figure 3.7 Scanner Control Buttons

These buttons are used to control various scanner operations.

The **[ORIG]** button is used to obtain densitometer readings. While the scanner is in the monitor mode it will operate as a densitometer. Point the analyse head at any part of the subject, and the scanner will display density readings for that area in the three colour channels on the Current Value Display.

The **[SEP]** button is used to change the Current Value Display from original density to separation dot %.

This button is used to change the scanner from the monitor mode to the View mode. This allows copy to be seen through the analyse viewer.

Pressing it a second time returns the scanner to the monitor mode.

The **[AUTOBAL]** button is used to prepare the scanner for the Autobalance function. The scanner will ask **AUTOBAL YES/NO?** Press **[YES]** to Autobalance. Autobalance is the automatic calibration and matching of the three input channels (similar to zeroing a densitometer). Clear cylinder represents minimum density, and an internal shutter, which cuts off the light to the photomultipliers, represents maximum density. An intermediate density is represented by the 'B' patch neutral density filter, which is used automatically by the scanner during autobalance.

The machine will give one bleep to indicate a satisfactory autobalance, or three bleeps to indicate an unsatisfactory autobalance. The machine will still operate if three bleeps have been signalled.

Traverse Left Traverse Right

These buttons are used to control the manual traversing of the analyse carriage and operate only while the button is pressed. The rate of traverse is increased when **[FAST]** is pressed together with either a Traverse Left or Traverse Right button.

This button is not used.

This button is used to end all current operations, i.e.:

- During a scan the **[STOP]** button will stop the sequence. The scanner will return to the monitor mode.
- When the analyse keyboard is being used, **[STOP]** will cause the scanner to leave the current function, shown on the Alphanumeric Display, and return to the monitor mode.

WARNING

This is not the emergency-off switch.

This button is used to obtain the Cylinder Release or Datum Search functions. When pressed, either **CYLINDER RELEASE ??** or **DATUM SEARCH??** is displayed.

If the operation is the one required, press **[YES]**.

If the operation is not the one required, press **[NO]**.

Press the Cylinder Release/Datum Search button again to display the other operation.

Press **[YES]** to start the required operation.

The **[CAL]** button, followed by an entry of numbers from the keypad gives access to one of the scanner adjustment and calibration procedures.

This button is not used.

CHAPTER 4

GENERAL OPERATING PROCEDURES

CONTENTS

Section		Page
4.1	POWER-UP	4-1
4.1.1	Power-up Sequence	4-1
4.1.2	Analyse, Xenon Lamp	4-1
4.1.3	Analyse, Scanner Switch and Cylinder	4-2
4.1.4	Scanner Initialization	4-2
4.2	POWER-DOWN	4-3
4.2.1	Power-down Sequence	4-3
4.2.2	Analyse - Scanner Switch and Xenon Lamp	4-3
4.3	ANALYSE CYLINDER PROCEDURES	4-4
4.3.1	Cylinder Cleaning	4-4
4.3.2	Transparency Mounting	4-5
4.3.3	Mounting Multiple Transparencies	4-7
4.3.4	Cylinder Changing	4-7
4.4	ANALYSE OPTICS	4-13
4.4.1	Setting Focus, Aperture and Filter	4-13
4.4.2	Adjusting Lamphouse Optics	4-13
4.4.3	Centering the Spot	4-15

ILLUSTRATIONS

Figure		Page
4.1	XLS Front Panel	4-1
4.2	Mounting a Transparency with Liquid Paraffin	4-5
4.3	Analyse Lens Positions	4-9
4.4	Scanning Lens Removal	4-10
4.5	Position of Rests for Loading Small Cylinder	4-11
4.6	Position of Rests for Loading Large Cylinder	4-11
4.7	Location of Lamphouse Controls	4-14

CHAPTER 4

GENERAL OPERATING PROCEDURES

4.1 POWER-UP

4.1.1 Power-up Sequence

To power-up the analyse unit:

1. Switch on the xenon lamp.
2. Switch on the remaining scanner functions with the **SCANNER** switch.
3. Initialize Scanner.

Note: On the analyse unit the **SCANNER** switch is interlocked with the xenon lamp. It is impossible to switch on the analyse unit before switching on the xenon lamp.

4.1.2 Analyse, Xenon Lamp

1. Remove the lower left-hand front panel from the analyse unit to gain access to the XLS.

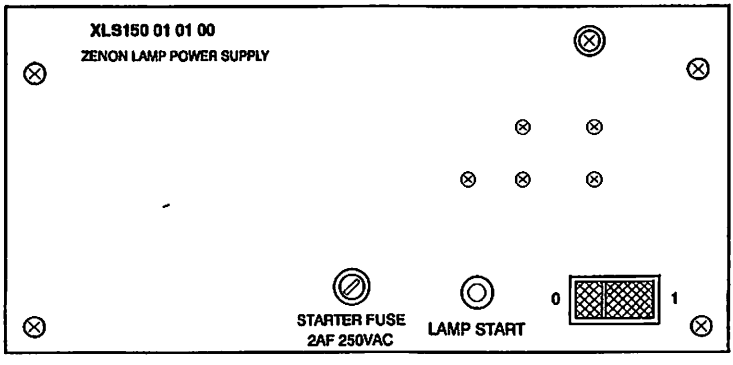


Figure 4.1 XLS Front Panel

2. Switch on the lamp as follows:
   a) Switch on the **LAMP** switch on the control panel.
   b) Switch on the **MAINS ON** switch on the XLS panel.

c) Momentarily depress the **LAMP START** push-button switch on the XLS front panel. Do not keep switch depressed, as this may cause damage to the XLS.

The lamp starter will make a noise for about one second, after which the lamp should light. The **MAINS ON** indicator lamp should also light. If the lamp does not light, press the button again, after waiting at least five seconds. Repeat until lamp lights. Most lamps light the first time but some may require two or even three attempts, especially when cold and/or new. If the lamp fails to light, turn off the **LAMP** switch on the control panel. Check that the lamp is correctly fitted.

4.1.3 Analyse, Scanner Switch and Cylinder

1. Switch on the analyse unit **SCANNER** switch.
2. Rotate the analyse cylinder through one revolution to set its angular position in the scanner's computer.

Later on, you should adjust the lamphouse optics and align the analyse head.

4.1.4 Scanner Initialization

When a scanner is switched off, some information previously entered by the operator will be lost from the scanner memory. For example, JVs, original position values, final size values etc. The operator will enter new information during job set-up. Unless and until new information is entered, the scanner will use BVs which are permanently stored in its memory.

However, some information must be entered by the operator as soon as a scanner is switched on.

4.2 POWER-DOWN

4.2.1 Power-down Sequence

The full power-down sequence is defined:

1. Switch off the **SCANNER** switch
2. Switch off the xenon lamp.

4.2.2 Analyse - Scanner Switch and Xenon Lamp

The xenon lamp should not normally be switched off unless the scanner is to be unused for long periods. When leaving the scanner overnight and at weekends, reduce the light on the photo-multipliers. This can be done by:

1. taping a 0.9 neutral density filter onto the cylinder, or
2. selecting the most dense filter in the lamphouse.

If it is necessary to switch off the xenon lamp, switch off the **SCANNER** switch and then switch off the **LAMP** switch.

4.3 ANALYSE CYLINDER PROCEDURES

4.3.1 Cylinder Cleaning

The outside of the cylinders should be cleaned using one of the following cleaning solvents:

- SDS Scanner Drum Cleaner

  Source : SDS Drum Service GMBH
  Bekwisch 9
  2000 Norderstedt
  Germany
  Telephone: 49-40-523 9837

- Kami DC 2001

  UK Agent : D Mycroft & Co
  40a Jasmine Grove
  London SE20 8JP
  Telephone: 081-659 1424

This item should be obtained from a local supplier, as it is not a Crosfield-supplied product.

WARNING

These solvents are highly flammable and must be used with care. Before handling, see Section 2.7, Chemical Safety.

Analyse drums must be removed from the analyse unit when cleaning is required. An exception may be made when only a small area of the drum is to be cleaned. In this case wet a tissue sparingly with solvent and apply it to the cylinder with care. Do not take the solvent container to the analyse unit.

A cylindrical lambswool-covered mop is provided for cleaning inside the analyse cylinder. The recommended cleaning technique is to cover the head of the mop with a tissue moistened with cleaning fluid, push the mop up the cylinder and then repeat with a clean tissue for a final polish.

The effect of any static, generated while the outside of the cylinder is being cleaned, can be neutralized using the Static Master brush.

4.3.2 Transparency Mounting

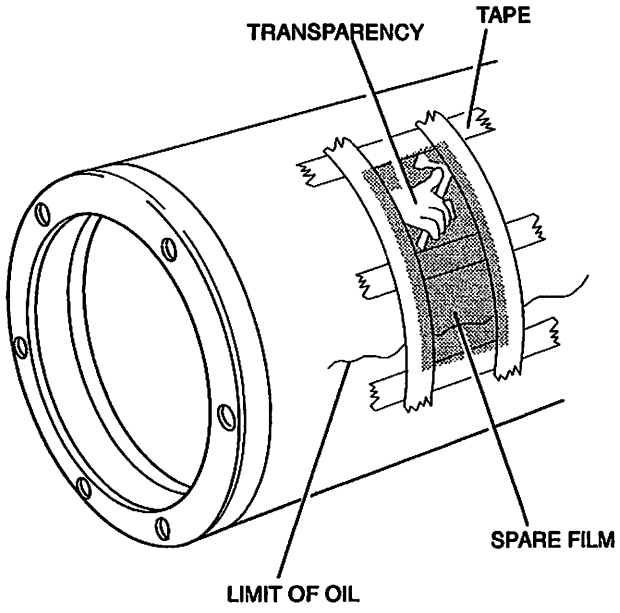


Figure 4.2 Mounting a Transparency with Liquid Paraffin

1. Clean the transparency with a small quantity of film cleaner applied to a soft lint-free cloth or soft tissue.
2. Set the loading table for use with the required analyse cylinder - roller handles out for the large cylinder, or roller handles in for the small cylinder.
3. Lift the transparency flap and lower the cylinder carefully onto the rollers.
4. Select the appropriate pressure roller and fit it to the roller shaft. Set the roller in one of the roller slots behind the cylinder - use the farther slots for the large cylinder and the nearer slots for the small cylinder.
5. Bring the pressure roller into position, bearing against the cylinder, by operating the knob at the right-hand end of the mounting table.
6. Bring the transparent flap down.

   Note: Tesa 4105 tape is recommended for use when attaching transparencies to the analyse cylinder. The tape is manufactured by Beiersdorf A.G., Hamburg, Germany.

7. For enlargements less than 350%.

   a) Use Anti-Newton Ring spray or powder and holding the transparency at arm's length from the nozzle of the spray, spray onto the side of the transparency that is to contact the cylinder. At the correct distance from the transparency, the spray nozzle will produce a finely grained matt covering on the transparency with no runs (it is advisable to practice with a spare piece of clear film or transparency beforehand, to ensure good results). Take care to ensure that no dust is impregnated in the spray covering.

   b) Fix self-adhesive tape along the top edge of the transparency. Using the grid lines marked on the flap as a guide, align the transparency carefully with the cylinder. The alignment is particularly important with large enlargements of small originals, as any small errors in alignment will be more obvious on the enlarged separation.

   c) Apply self-adhesive tape to the trailing edge of the transparency and turn the cylinder so that the pressure roller rolls over the transparency and fixes it to the cylinder.

8. For enlargements of 350% or more.

   a) Fix self-adhesive tape along the top edge of the transparency. Using the grid lines marked on the flap as a guide, align the transparency carefully with the cylinder. The alignment is particularly important with large enlargements of small originals as any small errors in alignment will be more obvious on the enlarged separation.

   b) Place a spare piece of film 1-2 mm from the trailing edge of the transparency and tape the two together. Apply self-adhesive tape to the lower edge of the spare film. Do not butt the film to the transparency as this causes air bubbles to form.

   c) Lift the spare film and transparency and apply a small amount of liquid paraffin to the **middle of the leading edge**. Turn the cylinder, allowing the pressure roller to squeeze out the excess oil. When the pressure roller is half-way over the trailing edge of the film, wipe away the remaining oil from underneath the film, using a tissue. Continue turning the cylinder past the film. Do not turn the cylinder a second time under the pressure roller.

   d) Wipe the excess oil away with a tissue and check for dust, bubbles, etc. that may be trapped under the transparency. Clean the oil from

the pressure roller, cylinder and transparency with a tissue moistened with solvent, (see Section 4.3.1).

e) Finally, apply adhesive tape to the side edges of the transparency, to prevent the oil from escaping when the cylinder is rotating.

Scratched Transparencies

The effect of scratches on a transparency can be reduced by mounting the transparency on liquid paraffin. This is recommended in any case when making enlargements exceeding 350%, to eliminate Newton's Rings. The technique will be effective for scratches on the **inner** face of the transparency which lies next to the cylinder surface.

There are two ways to reduce the effect of scratches on the **outer** face of the transparency. The transparency may be overlaid with clear film, using more liquid paraffin. Alternatively, the operator can rub a little petroleum jelly carefully over the surface to fill the scratches, after the transparency has been mounted on the cylinder.

4.3.3 Mounting Multiple Transparencies

When mounting multiple transparencies, the same procedure as outlined in Section 4.3.2 should be carried out. It is recommended that the transparencies are distributed evenly around the surface of the cylinder to improve dynamic balance and reduce vibration. This is particularly important when using the large cylinder.

4.3.4 Cylinder Changing

The cylinder cannot be released unless the cylinder rests are in the correct position.

1. Press:

   If

   is displayed,

   Respond:

   Press:

If CYL RELEASE? is displayed,

Respond: YES

The carriage will move towards the right-hand limit.

2. To safeguard against accidental pushing of the button, the display will ask:

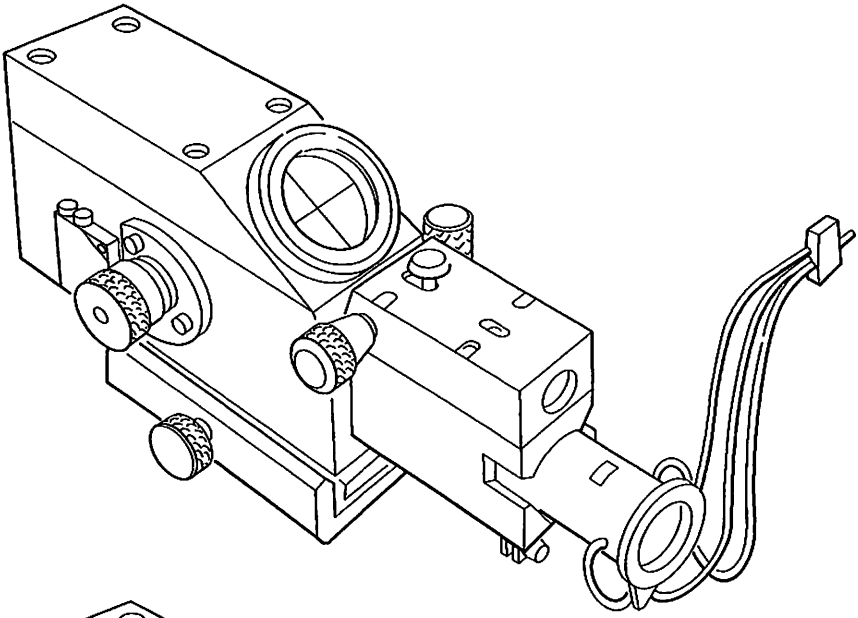
CYLINDER ROTATING?

Respond: NO

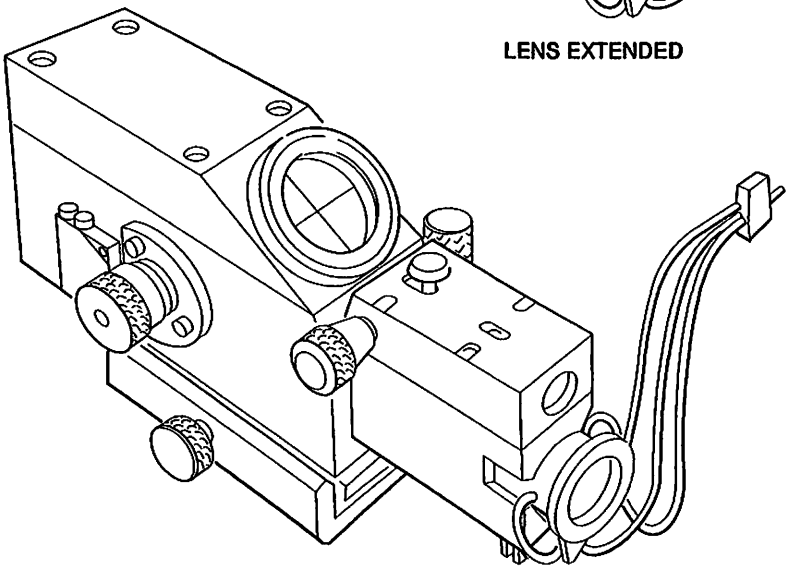
3. The carriage will move further to the right releasing the cylinder from the hubs onto the rests.
4. Remove the cylinder and return it to its box.
5. If the cylinder rests are in the down position, put them upright. **The machine will not traverse with the cylinder out and the cylinder rests down.** Move the carriage to the left, so that the centre optics (scanning) lens can be reached.
6. If necessary, retract the analyse lens. Press the plastic button down and push the lens tube slightly backwards. Release the button. Continue to push the lens tube backwards until it locks in the retracted position.
7. Remove the scanning lens:

   With the left hand, pull the spring-loaded retaining pin at the end of the centre optics tube and hold it.

   Withdraw the scanning lens by sliding it out of its location. Place the scanning lens in its box.



LENS EXTENDED



LENS RETRACTED

Figure 4.3 Analyse Lens Positions

8. Insert the other scanning lens or the blanking plug.

   On the new lens you will see a shallow slot called a keyway, running down the barrel. This keyway locates on a pin inside the body of the centre optics tube.

   Hold the lens by the collar with the keyway uppermost. Pull the retaining pin outwards and insert the lens. Gently push the lens into position (it may be necessary to rotate the lens a little to find the correct location) and release it when it is firmly seated. Release the retaining pin.

   The lens should now have only a small amount of rotational movement and it should not be possible to move the lens into or out of the centre optics tube.

9. If the small cylinder is to be loaded, move the analyse lens to the extended position.

   Press the plastic button down and pull the lens tube forwards, slightly. Release the button. Continue to pull the lens tube forward until it locks in the extended position.

10. Move the carriage to the right again so that the cylinder may be inserted.

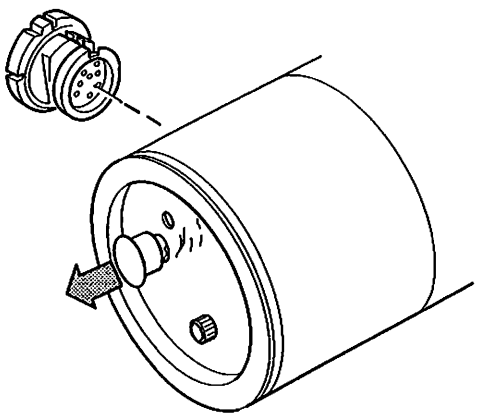


Figure 4.4 Scanning Lens Removal

CAUTION

Always check that the cylinder rests are SECURE in the correct position, whenever their position is changed.

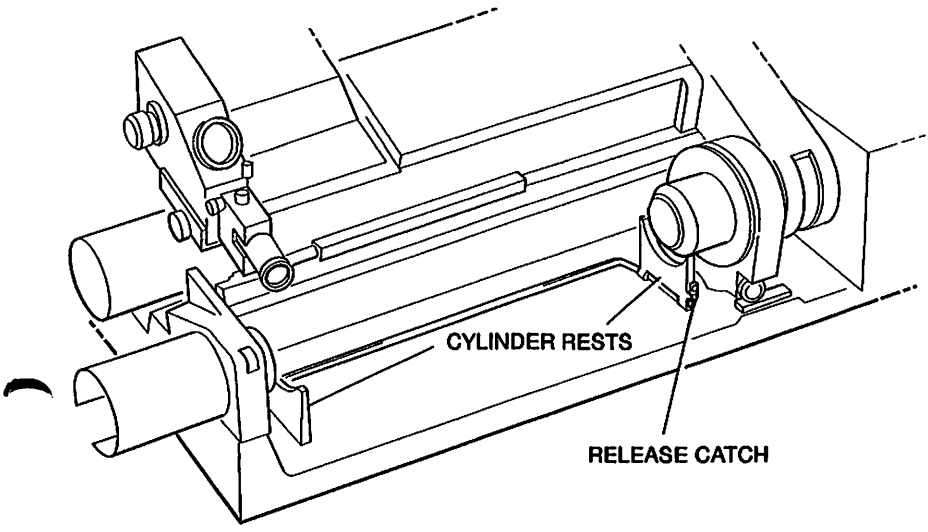


Figure 4.5 Position of Rests for Loading Small Cylinder

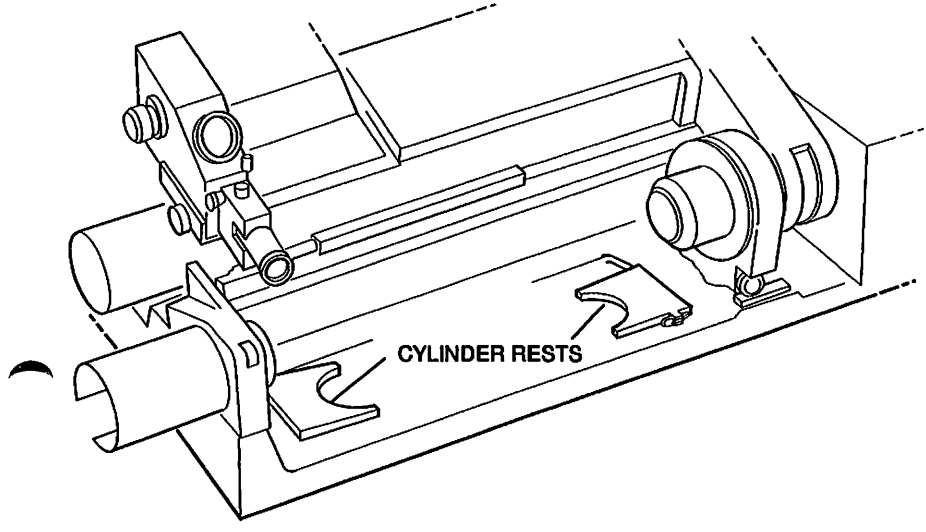


Figure 4.6 Position of Rests for Loading Large Cylinder

11. If the large cylinder is to be loaded, put the rests down, (see Figure 4.6).
12. Place the new cylinder into position on the cylinder rests. Turn the hub to line up the locating ball on the hub with the slot in the left-hand end

of the cylinder. **Do not** turn the cylinder on its rests as this will damage the cylinder surface. Locate the large cylinder (if used), so that its left-hand rim is within 4 mm of the sensor face, or the carriage will not traverse.

13. Check that the analyse lens is in the correct position for the new cylinder.

CAUTION

This check is essential at this point to avoid damage to part of the machine.

A lens position sensor prevents carriage traverse if the large cylinder is loaded **and** the lens is in the forward position.

14. Press:

Press:

The hubs will move towards the cylinder. Check that they engage the cylinder correctly, with the locating ball and pin seating properly in the cylinder slots.

15. Check the analyse head position using **[CAL] 40**, View Scan Spot, (see Section 4.4.3).
16. Check the analyse lens focus, (see Section 4.4.1).
17. Autobalance, (see Section 5.6).
18. Rotate the cylinder through one complete turn. This is necessary to set its angular position in the scanner's computer. The scanner will then be ready for production.

4.4 ANALYSE OPTICS

4.4.1 Setting Focus, Aperture and Filter

1. If necessary, mount a transparency, emulsion-up on the analyse cylinder, (see Section 4.3.2).
2. If necessary, load the cylinder, (see Section 4.3.4).
3. Press: if necessary, and traverse the analyse head to view the transparency in the View screen.
4. Turn the analyse head focus adjuster to obtain sharp focus at the **centre** of the cross-hairs.
5. Press: again to return to the monitor mode.
6. Set the analyse aperture according to the Scanner Fact Chart, (see Chapter 8). The aperture knob is at the rear left-hand side of the analyse head. The number of the aperture required should be adjacent to the red spot on the side of the analyse head.
7. Set the analyse filter according to the Scanner Fact Chart. The filter knob is at the rear right-hand side of the lamphouse. The number of the filter required should be adjacent to the white spot on the side of the lamphouse.

4.4.2 Adjusting Lamphouse Optics

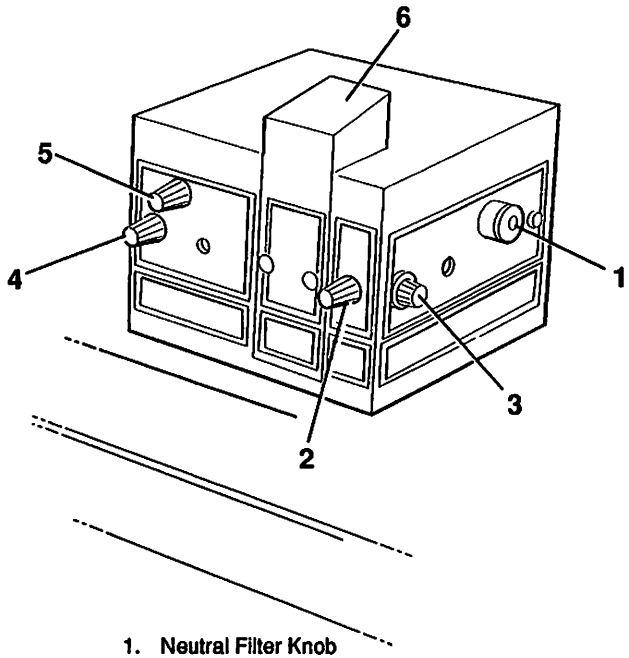
The lamp is in a fixed position and cannot be adjusted. The lamphouse optics are adjusted to achieve optimum light output.

The adjustments should be made after a lamp change. After switching on a new lamp, allow at least $^1/_2$ hour (preferably longer), for the temperature to stabilize, before making adjustments. These should be repeated every few hours until the lamp is stable. Thereafter, weekly adjustment will suffice.

4.4.2.1 Transmission Copy

1. Fit the large cylinder.
2. Check that the scanning spot is centered on the cross-hair using the **[CAL] 40** described in Section 4.4.3. Use analyse aperture 4D.

Note: If machine fails to autobalance due to poor lamp position, a lower density lamphouse filter should be selected (e.g. C, B or A).



1. Neutral Filter Knob
2. Transmission Alignment Control (A)
3. Transmission Alignment Control (B)
4. Reflection Alignment Control (A)
5. Reflection Alignment Control (B)
6. Lamp Cover

Figure 4.7 Location of Lamphouse Controls

3. Enter **[CAL] 41** or **[CAL] 42** to give a density readout of approximately 0.4 or 2.4 respectively. Set the lamphouse transmission-adjusters A and B so that minimum density read-out is observed on the Magenta channel.
4. Autobalance now using 4D, if this was not achieved in Step 2.
5. Enter **[CAL] 41** or **[CAL] 42** and note the original density read-out on the Magenta channel. Turn the lamphouse transmission adjuster B anti-clockwise until this read-out increases in density by between 0.10 and 0.15. De-select CAL 41 or 42 by pressing **[ENTER]**. Press **[STOP]**.

4.4.2.2 Reflection Copy

1. Fit reflection copy blanking plug and large cylinder. Mount white reference patch on cylinder (e.g. Part No. 5511-4140, or other white copy will do), and focus on it.

2. Press:

   Set the analyse aperture to 5.

   Press:

   Press:

   Note: If machine fails to autobalance due to poor lamp positioning continue anyway.

3. Enter **[CAL] 41** or **[CAL] 42** and observe density readout on Magenta. Turn lamphouse reflection adjusters A and B for a minimum. De-select CAL 41 or 42 by pressing **[ENTER]**. Press **[STOP]**.

4. If autobalance was not achieved for transmission copy re-check autobalance now.

Note: The selection of a density of between 0.10 and 0.15 moves the lamp cathode image away from the analyse lens aperture and sets the xenon arc to a stable position.

4.4.3 Centering the Spot

1. Enter **[CAL] 40** and press **[ENTER]** to select **VIEW SCAN SPOT.**

2. The scan spot will appear in the viewer. Use the analyse head adjusters to bring the spot to the centre of the cross-hairs.

3. Perform an autobalance.

This adjustment should be made every morning at start-up and periodically through the day.

It should always be made whenever the analyse cylinder is changed.

Note: Do not try to centre the spot by observing minimum density readings. This can cause inaccurate alignment and colour tracking errors.

CHAPTER 5

ANALYSE UNIT - PHOTOGRAPHIC PROCEDURES

CONTENTS

Section			Page
5.1	INTRODUCTION		5-1
5.2	CALIBRATION		5-1
5.3	POSITION, TRAVERSE, ENLARGEMENT AND FINAL SIZE		5-2
	5.3.1	Defining Scanning Area Co-ordinates (Original)	5-3
	5.3.2	Analyse Carriage Traverse	5-5
	5.3.3	Slow Traverse Speed Adjustment	5-5
	5.3.4	Lost Position and Datum Search	5-5
	5.3.5	Setting the Final Size of Separation	5-6
	5.3.6	Picture Distortion	5-9
	5.3.7	Micro-enlargement	5-10
5.4	EDG		5-12
5.5	UNSHARP MASKING (USM)		5-14
	5.5.1	USM Sharp and USM Smooth	5-14
	5.5.2	Black Gain	5-15
	5.5.3	Cross-coupling of USM Data	5-15
	5.5.4	CAL 508 Functions (USM variables)	5-17
5.6	AUTOBALANCE		5-22
	5.6.1	Function	5-22
	5.6.2	Operation	5-22
	5.6.3	Transmission Autobalance Sequence	5-22
	5.6.4	Reflection Copy Autobalance Sequence	5-22
	5.6.5	Autobalance in Action	5-23
	5.6.6	Store and Recall of B Patch Targets	5-25
5.7	CUSTOMER VALUES AND JOB VALUES		5-27
	5.7.2	Recall Procedure	5-29
	5.7.3	Set-Up Function Values	5-30
	5.7.4	Reduction of Loading-Time	5-32

5.7.5 Clearing Job Values 5-34
5.7.6 Clearing Customer Values and Job Values ... 5-34

5.8 LUMINOSITY CURVES 5-35

5.9 PRINT DENSITY 5-35

5.10 GREY BALANCE (GB) 5-36
5.10.1 What Is Grey Balance? 5-36
5.10.2 Method 5-36
5.10.3 Grey Balance Set-up Procedure 5-37

5.11 BLACK PRINTER 5-40
5.11.1 Black Curve 5-41
5.11.2 Black Grey Balance 5-42
5.11.3 Black Tone 5-42

5.12 ENTER WHITE AND ENTER BLACK 5-44
5.12.1 Methods of Entry 5-44
5.12.2 Use of EW and EB to Achieve Facsimile ... 5-46
5.12.3 Operation 5-47
5.12.4 EW & EB and Black Printer 5-51

5.13 TONE 5-54
5.13.1 What is Tone? 5-54
5.13.2 What It Does 5-54
5.13.3 Where To Use It 5-56
5.13.4 Operating Sequence 5-57

5.14 NEUTRAL TONE BOOST 5-58

5.15 COLOUR CORRECTION 5-59
5.15.1 Selection of Appropriate Controls 5-59
5.15.2 To Enter The Change 5-59
5.15.3 Colour Correction and Installing CVs 5-61

5.16 PASTEL COLOUR BOOST 5-62
5.16.1 Colour Boost: All Colours 5-62

5.17 SUPER PASTEL 5-63
5.17.1 Pastel Mode 5-63
5.17.2 Pastel Curve 5-63
5.17.3 Colour Selective Boost 5-64

5.18 POLYCHROMATIC COLOUR REMOVAL 5-65
5.18.1 Basic Operating Procedures 5-65
5.18.2 Editorial Procedure 5-66
5.18.3 Additional PCR Procedures 5-67

5.19 CAST 5-70
5.19.1 Alternatives to CAST 1 and CAST 2 5-72
5.19.2 Operating Sequences 5-73
5.20 CATCHLIGHT (CL) 5-76
5.20.1 Function 5-76
5.20.2 Operation 5-77
5.20.3 Channel Selective Catchlight 5-77
5.21 LIMIT 5-78
5.21.1 Operating Sequences 5-78
5.22 LINE MODE 5-80
5.22.1 Operation 5-80
5.23 EXPOSE 5-82

ILLUSTRATIONS

Figure **Page**

5.1 Small Cylinder with Copy Mounted 5-2
5.2 Analyse Cylinder Datum Lines and Position Parameters 5-3
5.3 Picture Distortion 5-9
5.4 USM - % Dot Variations Across an Edge 5-14
5.5 USM - Effect of Threshold 5-18
5.6 Fringe Clip Applied to Light and Dark Fringes 5-19
5.7 USM Roll-Off 5-19
5.8 Data Storage and Flow Paths 5-29
5.9 Grey Balance Test Forme 5-38
5.10 Grey Balance Graph for Print Density 5-39
5.11 Black Tone Control Diagram 5-40
5.12 Black Printer Curves 5-52
5.13 TONE Curves (HL, MT and SH) 5-54
5.14 TONE-Effective of Change of One Index Number .. 5-55
5.15 Reduction of PCR in Shadows 5-67
5.16 Reduction of PCR in Highlights 5-68
5.17 CAST Curves 5-71
5.18 CATCHLIGHT - Slope Curves 5-76
5.19 LIMIT Curves 5-78
5.20 LIMITS 5-80

TABLES

Table		Page
5.1	Effects of Change in Tone Index Numbers	5-55
5.2	Effects of Tone Settings	5-56
5.3	TONE - Examples of Use	5-56
5.4	Pastel Curve Values (CAL 513)	5-64

CHAPTER 5

ANALYSE UNIT - PHOTOGRAPHIC PROCEDURES

5.1 INTRODUCTION

This chapter explains the operating procedures for Magnascan Plus analyse unit, using Version V9.32 software.

The assessment of originals, especially transparencies, is never satisfactory if conducted with the transparency mounted on the cylinder. It should therefore be done before they are mounted. The final size that is required can be calculated in several ways by the scanner. Make any necessary measurements **before** mounting the transparency on the cylinder.

The computer needs a value for every parameter it is possible to set, and will use a default value (Basic Value) if the operator does not set a value of his own. A default value will be a typical value for the parameter in question, or a value that renders the parameter inoperative. The action of calling up a Customer Value (CV), will instruct the computer to use that CV as a default value. The operator may change the setting if he wishes, or he may leave the value as it is.

Photographic reference data is incorporated in Chapter 8.

5.2 CALIBRATION

Magnascan Plus only requires input calibration (autobalance). This is used to compensate for the aging of the xenon lamp and ensures that the unit sees neutrals as neutrals.

Autobalance should be performed immediately before an input scan. The procedure is described in Section 5.6.

5.3 POSITION, TRAVERSE, ENLARGEMENT AND FINAL SIZE

Mount copy squarely on the cylinder. Be careful not to unbalance the cylinder.

An analyse cylinder may be unbalanced by copy which is mounted on it. Severe vibration may occur when the cylinder is turning at full speed. In some cases the Alphanumeric Display may show the message **A SPEED**, meaning that synchronous rotation has not been achieved. The problem is most likely to arise when reflection copy is mounted on the large cylinder. Place a similar size copy or blank material at 180° spacing around the cylinder.

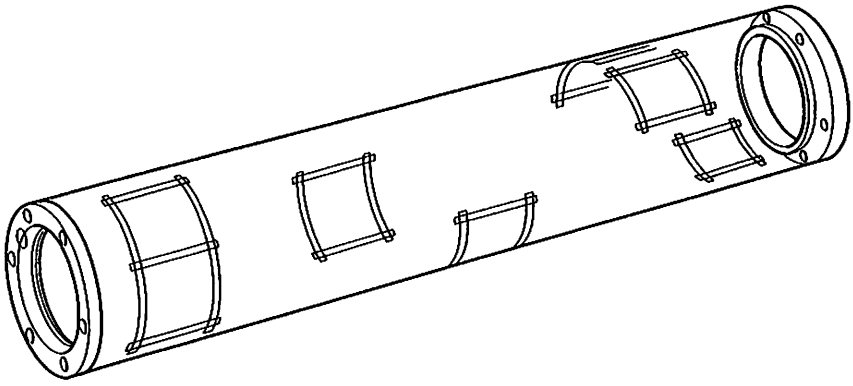


Figure 5.1 Small Cylinder with Copy Mounted

You must enter specific size and position values for each original, so that you only scan the part of the cylinder that you require.

Separations can be produced with the exact cut-offs for the (rectangular) shape that you require.

Note: If the scanner has just been switched on, or if the analyse cylinder has been changed, rotate the analyse cylinder through one complete turn, in either direction so that the scanner can locate its rotational DATUM position. **If this is not done position entry is likely to be corrupted.**

You may not require accurate cut-offs, or it may be difficult to mount a picture squarely (e.g. 35 mm transparencies) on the cylinder. Check that the dimensions you set will define an area on the cylinder which includes all the final picture required.

5.3.1 Defining Scanning Area Co-ordinates (Original)

There are two parameters that must always be set. These are a horizontal imaginary start line and a vertical datum line close to the edge of the cylinder, (see Figure 5.2). The scanner uses these parameters as reference data when making positional calculations. The large rectangle in the figure represents the analyse cylinder as it would appear if it were opened out and laid flat.

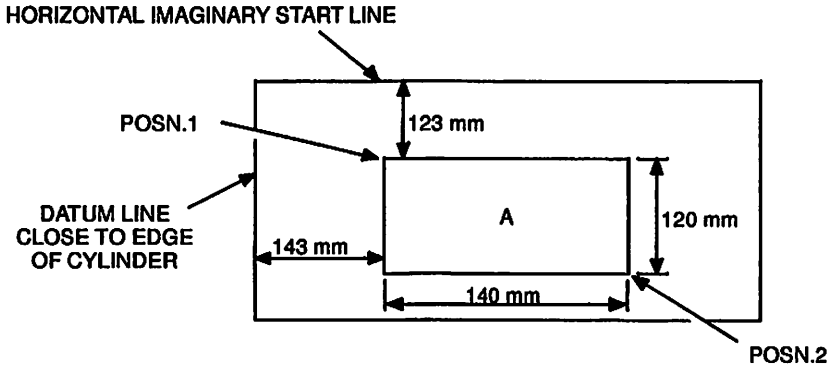


Figure 5.2 Analyse Cylinder Datum Lines and Position Parameters

Point the analyse head at the corner of the required area corresponding to position 1 of copy A of Figure 5.2. To do this, use buttons,

◁ , ▷ and FAST as required (for horizontal alignment) and rotate the cylinder (for vertical alignment).

It can be difficult to find a point on a transparency using the view-screen. As an aid, lines are engraved around the circumference of the outer and inner faces of the diffuser in the centre-optics tube. The outer line is red and the inner line black. Without the aid of the view-screen, align these two lines and the horizontal image position on the transparency. Rotation of the analyse drum will then bring the required point on the transparency within the area of the view-screen. Fine alignment can then be made.

If it is found difficult to perform this fine alignment the traverse speed may be adjusted, (see Section 5.3.3).

Press: POSN

```
4@ 1.00 50 150
1 V 123.0 H 143.0
```

The co-ordinates for position 1 of copy A now appear as shown on the lower line of the Alphanumeric Display, defined to the nearest 0.1 mm relative to the leftmost point on the imaginary start line.

Enter position 1 of copy A, thus:

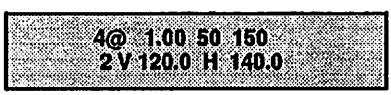
Press: [ENTER]

The display now shows **2** instead of **1** on the lower line. The zero values for **V** and **H** indicate that you are still pointing the analyse head at the entry point for position 1.

Point the analyse head at position 2 of copy A. To do this, rotate the cylinder and use buttons

[◁], [▷] and [FAST], as required.

Check with the View aperture of the analyse head that the head is pointing correctly, adjusting if required. The second line of the display now shows the co-ordinates of position 2 of copy A relative to position 1.



To enter position 2

Press: [ENTER]

The display is returned to the monitor mode.

Note: If you pressed **[ENTER]** when the analyse head was pointing at the wrong position, correct as follows:

Position 1 error. Press **[ENTER]** to exit from the Position mode, then press **[POSN]** to re-enter the Position mode. Re-enter both position 1 and position 2.

Position 2 error.

1. Re-enter the Position mode, aiming at Position 2 thus:

   Press: [POSN]

   Enter: **2**

2. Re-define co-ordinates of position 2.
3. To enter position 2 and exit from the Position mode:

Press: [ENTER]

5.3.2 Analyse Carriage Traverse

To obtain slow traverse:

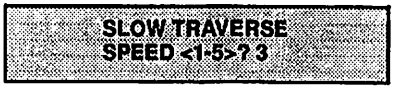
Press and Hold: [◁] or [▷]

To obtain fast traverse:

Also Press and Hold: [FAST]

5.3.3 Slow Traverse Speed Adjustment

The slow traverse speed can be adjusted. A slower speed than the default level may assist the accurate positioning of the analyse head. To enter a new slow-traverse speed, enter **[CAL] 882**. The slow traverse display appears indicating the current speed. (1=slowest, 5=fastest). The default value is 3. Enter the speed level required. The main display returns:



5.3.4 Lost Position and Datum Search

The analyse unit may occasionally lose the position of the analyse head along the cylinder. This will be indicated by one of three symptoms:

a) When selecting Position 1, the operator may notice that the 'H' figure is obviously incorrect.

b) The images produced may not correspond to the area of original selected by the operator.

To remedy this condition use Datum Search. It is controlled by the Cylinder Release/Datum Search [→|] button.

Datum Search will re-set the carriage position counter. The position of the original will then have to be re-entered.

Press:

Respond:

Press:

Respond:

Note: If **CYL RELEASE??** was the last question displayed, **DATUM SEARCH??** will be displayed as soon as you press the button.

The analyse carriage will then move to the far left and find its starting (or datum) position.

Alternatively, if the analyse carriage is close to the left-hand end of the leadscrew, manually traverse to the left-hand limit and then move the analyse carriage slightly to the right.

After every scanner reset, mains interruption, cylinder change, and datum search, rotate the analyse cylinder through one complete turn, to reset the cylinder position counter.

Datum search sets horizontal datum.

Cyl. rotation sets circumferential datum.

5.3.5 Setting the Final Size of Separation

Having selected the area to be scanned you must now determine the final size of the separation. There are two methods. You can set either enlargement or final size.

5.3.5.1 Enlargement Method

When the required enlargement value is known,

Press: [X]

Enter: **nn.nn** (where **n** is decimal digit)

Press: [ENTER]

The scanner has accepted the new enlargement value and has returned to monitor mode. The consequent output size can be checked.

To check the horizontal dimension, Press: [FINAL SIZE]

To check the vertical dimension, Press: [↕ YES]

If this final size is suitable, Press [FINAL SIZE] again to return to the monitor mode.

5.3.5.2 Final Size Method

This method is used when you know the final separation size (output size) required, but not the enlargement value. You have already entered POSN to define the size of the original to be scanned (input size).

You can define the final separation size using its horizontal dimension or its vertical dimension. Whichever dimension is used, the scanner will compute the other dimension to give the enlargement value. If different enlargement values for horizontal and vertical dimensions are then required, the picture distortion facility CAL 33 must be used, (see Section 5.3.6).

Input and output sizes are displayed together to the nearest millimetre. An output size can only be entered from the keypad as a **whole number**, i.e. to the nearest mm. An attempt to enter an output size to the nearest 0.1 mm will give the error message:

Final Size From Horizontal Dimension

In this procedure the enlargement is obtained by entering the required horizontal size of the output image.

Press:

The first number is input size, the second is output size.

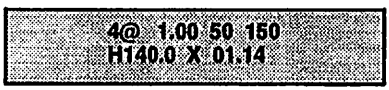
To retain this final size and return to the main display.

Press:

To change the final size, to size 160 mm for example:

Enter: **160**

Press:



The scanner calculates and displays the new enlargement value, for your approval.

To retain this value,

Press:

The scanner has accepted the new enlargement value and has returned to monitor mode. If **[FINAL SIZE]** is pressed again output size will be displayed as 160.0.

Final Size From Vertical Dimension

Press:

Press:

The display has changed to show input and output **vertical** dimensions. The remainder of this sequence is similar to the 'horizontal' procedure previously described.

5.3.6 Picture Distortion

Sometimes the original has not got the necessary proportions to produce the required final size. For instance, you may have a square input but require a rectangular output, (see Figure 5.3).

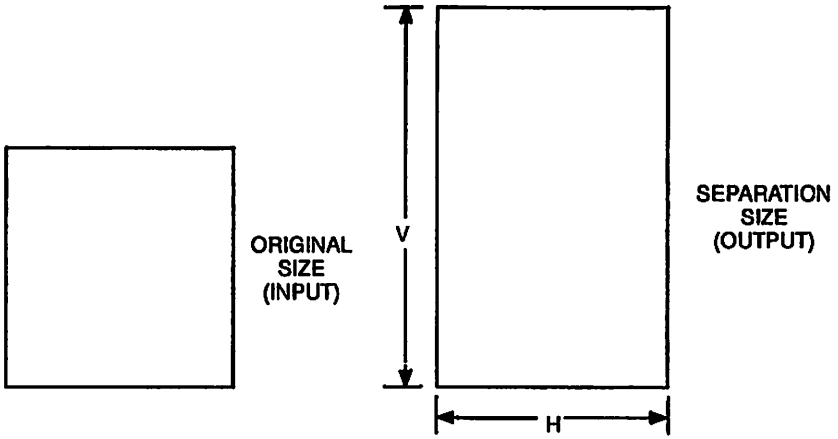


Figure 5.3 Picture Distortion

In this instance, CAL 33 allows you to enter one enlargement value corresponding to the horizontal dimension (H), and a different enlargement value corresponding to the vertical dimension (V).

If you do not know the horizontal or vertical enlargement values, these can be found by entering the final sizes as described in Section 5.3.5.2. Note the X values which appear in the final displays.

Press: CAL

Enter: **33**

Press: ENTER

If this current value is the one you require for horizontal enlargement,

Press: ENTER

If you wish to change the value, for example, 1.14:

Enter: **1.14**

Press: [ENTER]

The vertical enlargement is now shown on the display.

If required, you can change the vertical enlargement, using the same method. When ready:

Press: [ENTER] to return to the monitor mode

After leaving CAL 33 the top line of the display will show the horizontal enlargement. An * will also appear if the horizontal and vertical enlargements are not the same.

5.3.7 Micro-enlargement

Micro-enlargement is only possible when the enlargement factor is set between 20 and 600%.

To view or change micro-enlargement settings:

Press: [CAL]

Enter: **39**

Press: [ENTER]

To change the vertical micro-enlargement enter the modifier, **-nn** for a reduction in size or **nn** for an enlargement. Entries from -128 to 127 are permitted. Beyond this range corruption will occur. The default value is zero. A correction factor of 1 unit is equivalent to a 0.1% change in enlargement. For example, to reduce the image size by approximately 1.2%:

Press: [—]

Enter: **12**

To confirm the current vertical micro-enlargement:

Press: [ENTER]

If required, enter the new horizontal micro-enlargement modifier in the same form as the vertical modifier.

To confirm the setting as displayed:

Press: ENTER

The system returns to the monitor mode. An * appears on the display if the enlargement modifiers in the vertical and horizontal directions are not the same.

5.4 EDG

The EDG function determines the resolution of the input scanned image. three resolution options are available:

- A : 0808
- B : 1212
- C : 1616.

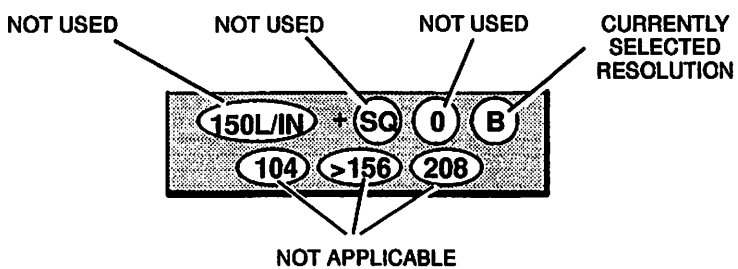
In each case the first two numbers specify the horizontal resolution and the second two numbers represent the vertical resolution, measured in pixels/mm.

To select a resolution:

Press:

Briefly, then

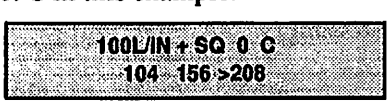
The only option available is the resolution, A, B or C. Other areas of the display can be changed but they will have no effect on the scan.



To select a different resolution:

Press:

The cursor will shift to the right, to turret C in this example.



If this is not the one you want, to select the remaining turret scan rate, i.e.: A.

Press:

To exit the EDG mode, and return to the monitor mode,

Press:

5.5 UNSHARP MASKING (USM)

Unsharp Masking is an electronically generated effect which increases the apparent sharpness of the subject. It works by accentuating contrast at an edge or around a point.

Figure 5.4 shows the dot % recorded as the scanner passes over the boundary between a light and dark tone. In the right-hand example USM has been applied. Note how the edge has been enhanced by the introduction of light and dark fringes. Providing excessive USM is not applied the eye will not see the fringes but will see a sharper image.

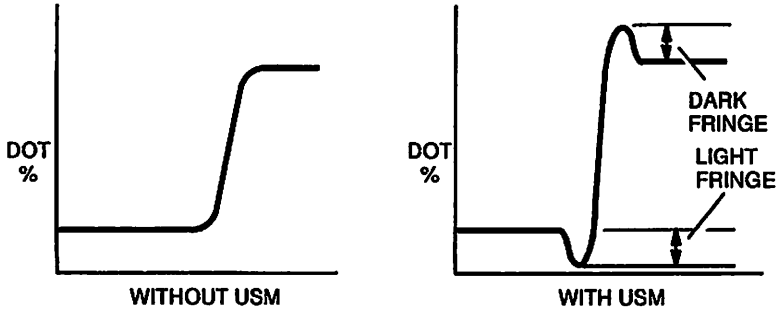


Figure 5.4 USM - % Dot Variations Across an Edge

5.5.1 USM Sharp and USM Smooth

USM Sharp

This is the principal USM setting. It determines the level of fringing to be applied. Its effect is, however, modified by other USM settings.

Enter values in the range 0-9 units, in steps of 1 unit (9 gives maximum USM).

USM Smooth

If low level contrast is enhanced, photographic grain, skin blemishes etc., become exaggerated. It is generally necessary to suppress USM at these contrast levels. Smooth gain is used for this purpose by reducing the Sharp gain at contrast levels below a Threshold setting (set with CAL 508, (see Section 5.5.4).

You can enter values in the range 0-9 units, in steps of 1 unit (9 gives maximum suppression).

Sharp/Smooth Operation

Press: USM

Y=Y M=C C=C B
USM SHARP =0

Enter: **5**

Press: ENTER

Y=Y M=C C=C B
USM SMOOTH =0

Enter: **0**

Press: ENTER

4@ 1.00 50 150
MAN C SEP SCAN

Note: The BV default values for fringe channels will be Y=Y, M=M, and C=C.

5.5.2 Black Gain

The Black Gain facility affects the black separation only. An increased factor results in an increase in fringe size and therefore produces a sharper black.

The BV for black gain is set up to 4. Values from 1 to 16 may be entered. Recommended values are listed in Chapter 8.

Press: USM

Enter: B

ENTER BLACK USM
GAIN 1-16 : 04

Enter: **n**

Press: ENTER

5.5.3 Cross-coupling of USM Data

Cross-coupling of data allows the operator to take USM information from one channel and apply it to another.

This information can be advantageous for subjects such as flesh tones, where very soft texture is required but at the same time sharp hair is needed. The Magenta and Yellow may be cross-coupled to the Cyan signal the flesh

tone will be made smooth because the Cyan will be the lowest signal in the Flesh colour, so blemishes or marks on the skin will not be enhanced. However, once the hair is sampled, the density changes will become more dramatic so the hair will appear sharp. Operator action for this activity would be:

Press: USM

Y=? M=? C=? B
USM SHARP = ?

Press: COLOUR

Enter: C and C and C

Y=C M=C C=C B
USM SHARP = ?

1. To enter a new value for sharp,

   Enter: **n** (range 0-9)

   Press: ENTER

   Then similarly, enter a value for smooth.

2. To re-input existing sharp and smooth values,

   Press: ENTER twice

For subjects such as landscapes, the Cyan and Yellow may be cross-coupled to the Magenta signal. The reason for doing this is that the end result should probably look very sharp. The Magenta channel will have the most contrast and as USM is based on % dot changes then this will give maximum USM in all channels.

It should be noted that when cross-coupling is used the Colour Gain data of the channel to which other colours are coupled will be used. This means in our flesh tone example, for instance, if the Yellow channel originally had high Colour Gain (4 to 6), once it is cross-coupled to the Cyan this will no longer apply. The Colour Gain will then be that for the Cyan channel, so instead of a value from 4 to 6, a Colour Gain of 1 will apply.

5.5.4 CAL 508 Functions (USM variables)

The CAL 508 functions are listed in the sequence in which they appear:

- Threshold (range: 0 to 32)
- Fringe Clip (range: 0 to 127)
- Density 1 (range: 0 to 255)
- Density 2 (range: 0 to 255)
- Colour Gain, Yellow (range: 1 to 8)
- Colour Gain, Magenta (range: 1 to 8)
- Colour Gain, Cyan (range: 1 to 8)
- Negative Gain (range: 1 to 8)
- White Attenuation (range: 1 to 8).

To display the functions:

Press: CAL

Enter: **508**

Press: ENTER

The first CAL 508 function appears. Recommended values are given in Chapter 8. To change the value:

Enter: **nn**

Press: ENTER

The display moves on to the next CAL 508 function.

To step forwards through the sequence, without making a change:

Press: ▽ or ENTER

To step backwards through the sequence,

Press: △

A keypad entry which is too high gives two bleeps and:

I/P OVER RANGE

To exit from the sequence it is necessary to step through each function.

Threshold

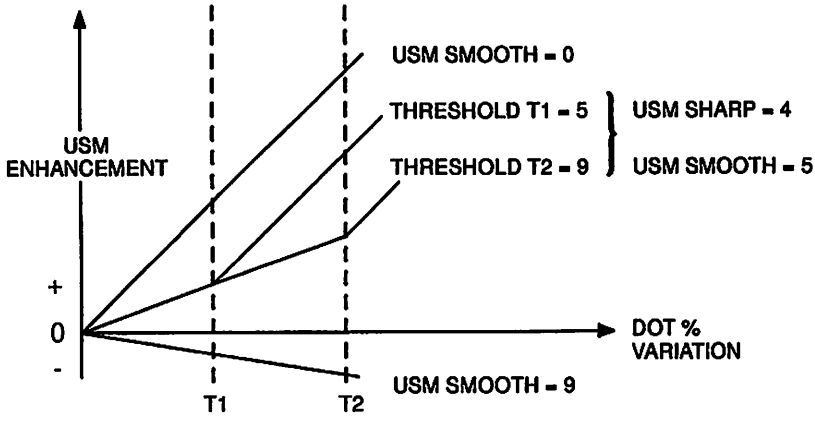


Figure 5.5 USM - Effect of Threshold

Threshold separates those density variations where USM Sharp has full effect, from those where USM Sharp is reduced, neutralized or reversed by USM Smooth.

You can enter values in the range 0-32 units, in steps of 1 unit. At 32 USM Sharp operates at maximum contrast levels. It is unlikely that you will need to enter values outside of the range 5-10. The BV (default value) is 5. At low Threshold values USM Smooth affects little picture detail. At higher Threshold values USM Smooth affects more picture detail and unsharp picture detail is likely. A very high Threshold value (above 10), together with a high smoothness value, will give a very unsharp separation.

If a set has 'Black Spots' then Threshold and/or Fringe Clip can be used to reduce these. Threshold can also be used for originals which are noisy in what should be smooth areas, or for subjects which are required to look smooth with few harsh edges, such as some watercolour or wash drawing originals.

Figure 5.5 demonstrates the effect of two example Thresholds for a range of USM Smooth values.

Fringe Clip

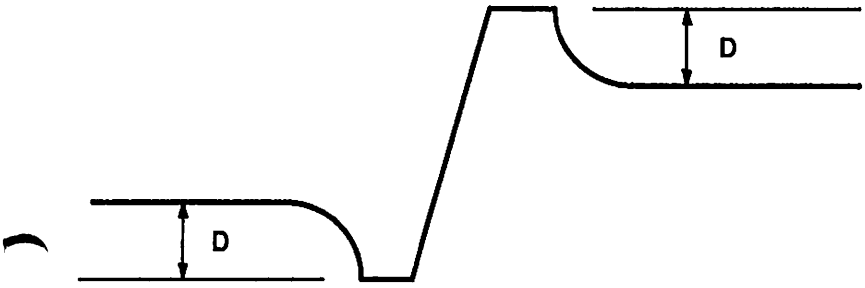


Figure 5.6 Fringe Clip Applied to Light and Dark Fringes

A high USM gain factor can give rise to heavy and unacceptable fringe characteristics. It is also possible that high frequency noise will occur, appearing as black spots in the fringe. To overcome these problems the Fringe Clip facility has been added. This facility has the effect of limiting the fringe level at high contrast areas whilst maintaining full USM gain in areas of lower contrast. For recommended values see Chapter 8.

Fringe Clip is entered as a value which specifies height D in Figure 5.6.

USM Density 1/2

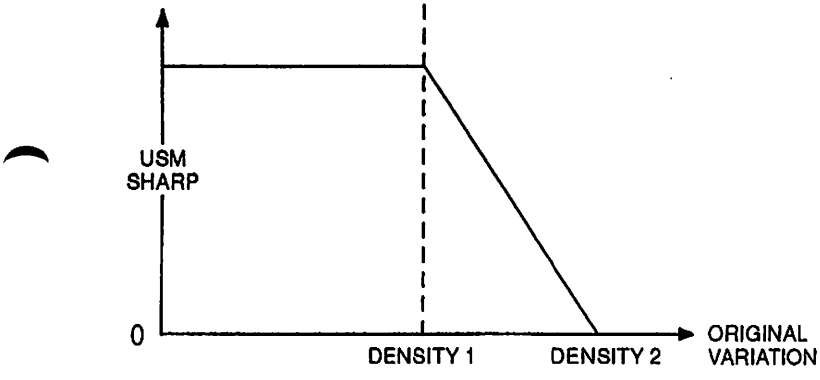


Figure 5.7 USM Roll-Off

There is little detail in high density areas of an original but usually the dyes are grainy. It is beneficial to reduce USM Sharp in these areas.

At **Density 1** USM Sharp starts to reduce.

At **Density 2** USM Sharp becomes zero.

Assuming a linear tone shape, USM Sharp would reduce as shown in Figure 5.7.

Density 1 and Density 2 must each be entered as a whole number value in the range 0 - 255 units. BV (default values) are: Density 1 = 150, Density 2 = 255 units.

Colour Gain

The gain for each of the yellow, magenta and cyan channels can be reduced independently, using modifying values which are entered at Steps 5, 6 and 7 respectively of the CAL 508 sequence.

Enter values from 1 to 8. A value of 1 gives no reduction in gain, 2 gives approximately the gain, 3 gives approximately $^1/_3$ the gain etc.. For normal use a value of 4 is recommended for the yellow channel and 1 is recommended for the magenta and cyan channels. These are also the default values.

Negative Gain

The dark fringe can be increased independently of the light fringe, using Neg Gain.

Neg Gain is useful when negative separations are to be scanned and then contacted to positive at a later stage. When the contact copies are made, fill in of white fringe detail (on the positive) occurs. To compensate for this, the dark fringe on the negative can be increased using Neg Gain.

Considerable increase in apparent sharpness can also be achieved by using Neg Gain on positive separations.

Enter values in the range 1-8 units in steps of 1 unit. The BV (default value) is 1. Normal working values should be 2 or 3. The black fringe becomes more visible especially when Neg Gain is greater than 3. The setting chosen is very subjective and only the user will know the type of separation his customers demand.

White Attenuation

Under certain circumstances light fringes need to be suppressed. For example when type overlays a tint panel the fringe can be highly visible. White Attenuation can be used in these cases, to reduce light fringes independently of dark fringes.

Enter values in the range 1-8 units in steps of 1 unit. As the value entered is increased, the white fringe is reduced. At the maximum value there is no white fringe.

It should be noted that if white fringes are totally removed, the overall effect can be an increase in density. The reason for this is that density takes an overall reading which includes the average of the White and Black fringes, so if the White fringe is removed the average increases.

5.6 AUTOBALANCE

5.6.1 Function

Autobalance is similar to zeroing a densitometer. In autobalance mode the clear cylinder represents minimum density and no light to the photomultipliers represents maximum density.

5.6.2 Operation

Autobalance proceeds automatically once it has been started. Set the analyse head to view clear cylinder. Whenever you autobalance, the correct cylinder, aperture, lens and focus etc. must be selected for the work to be done. Changes of cylinder, aperture, lens etc. will necessitate a new autobalance.

5.6.3 Transmission Autobalance Sequence

1. Set transmission mode.
2. Fit the correct centre optics lens S or L.
3. Set the analyse lens to its correct position.
4. Set the focus according to the job to be scanned.
5. Clean the area of cylinder to be used.
6. Aim the analyse head at the clean area.
7. Set the correct aperture and filter.
8. Check that the scan spot is central using CAL 40, (see Chapter 4).
9. Press:

10. Respond:

5.6.4 Reflection Copy Autobalance Sequence

1. Set reflection mode.
2. Fit centre optic blanking plug.
3. Set the analyse lens position for the large cylinder.

4. Set the focus according to the job to be scanned.
5. Place the white autobalance patch from the Repropack on the cylinder. Aim the analyse head at the patch.
6. Set the correct aperture.
7. Press:

AUTOBAL Y/N ?

8. Respond:

5.6.5 Autobalance in Action

During Autobalance the numbers in the Current Value Display fluctuate rapidly between high and low values. The Alphanumeric Display will fluctuate between:

AUTOBAL WHITE

and

AUTOBAL BLACK

The Alphanumeric Display will then show (transmission only):

B PATCH TRACK

A correct autobalance will be indicated by one bleep and the Alphanumeric Display will revert to the monitor mode, indicating that normal operation may continue. An incorrect autobalance will be indicated by three bleeps. The Alphanumeric Display will show a message like this:

TRY AGAIN YES OR NO ERR W : C B : Y

W: C = White autobalance error in cyan channel.

B : Y = Black autobalance error in yellow channel.

You now have two options. To autobalance again,

Press:

To continue to operate, Press

. The scanner will revert to the normal monitor mode but the error will remain.

If an error W or B results after a second attempt at autobalance, proceed down this list until the problem is found:

1. Check that the correct analyse aperture is selected.
2. Check that the correct analyse filter is selected.
3. Check that the analyse lens is in the correct position for large or small cylinder.
4. Check that the analyse spot is centred (CAL 40).
5. Check that the analyse focus is sharp on a typical sample of copy (this is to ensure that the analyse focus is not drastically out).
6. Check that the correct centre optics lens is selected.
7. Check that the transmission/reflection mode is correct.
8. a) Check that the area of cylinder viewed (transmission) is clean.

   b) Check that the white autobalance patch (reflection) is clean.
9. Clean centre optics and analyse lenses.
10. Check that the maximum light output is achieved by use of the lamphouse controls.

Assuming that none of the above checks have identified a problem, there are two other reasons for failure to autobalance.

a) Insufficient light is reaching the analyse head, giving an ERROR WHITE autobalance.

b) An electronic fault may be causing the lamp or other parts of the scanner to malfunction, affecting both WHITE and BLACK autobalance.

   i) WHITE ERROR

   Attempt autobalance several times more. If unsuccessful, after going through all the checks, fit a new xenon lamp.

   ii) WHITE AND BLACK ERROR

   There maybe an electronic fault. Call the Service Engineer.

5.6.6 Store and Recall of B Patch Targets

This facility enables B patch targets, which are the means of matching scanners to scanners/densitometers, to be recalled and stored by an operator.

Recall B Patch Targets

When no change is required to the previously entered values, including directly after power-up or reset, to recall these values for use by software, use the Recall B-Patch Values function, CAL 152, as follows:

Press: CAL

Enter: **152**

Press: ENTER

Press: ↕ YES

Previously entered values are recalled for future use by software.

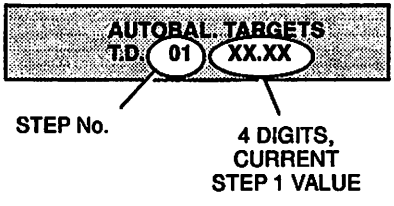
Store B Patch Targets

When different B patch values are to be used, these should be stored by means of the Store B-patch Values function, CAL 502, as follows:

Press: CAL

Enter: **502**

Press: ENTER



Note: Only Steps 7, 8 and 9 are for B patch values.

All 24 function steps must be stepped through, whether inputting a new value or not.

If no change to the step value (displayed bottom right) is required, step straight through by pressing **[ENTER]**. If a new value is required (e.g. in B-patch Steps 7, 8 and 9) select required 4-digit value and Press **[ENTER]**. As soon as a new value is selected it will appear at bottom right of the display. On pressing **[ENTER]** the next step number (bottom centre) appears with its corresponding current value (bottom right).

Continue as above, until all 24 steps have been entered. Then, again, Press **[ENTER]** to return to standard monitor mode.

Entering **[CAL] 502** directly after a power-up or reset will automatically overwrite all previously entered function values with basic values. If different B-patch values are required, then it is necessary to carry out the sequence:

1. Recall B-patch Targets with **[CAL] 152.**
2. Enter **[CAL] 502** and step through sequence to confirm the present values.

5.7 CUSTOMER VALUES AND JOB VALUES

Each scanner is supplied with a standard program incorporating Basic Values (BVs), which are typical values used for the appropriate printing process. It is difficult to make a standard that suits everybody. Thus we have given you the facility to store your customer's work.

The following functions are available: (The Alphanumeric Display abbreviations are given in brackets).

Grey Balance	(GBAL)	Cast 1	(CST1)
Colour Correction	(CC)	Cast 2	(CST2)
Output Calibration	(OCAL)	Limits	(LMTS)
PCR	(PCR)	Black Printer	(BLAK)
Catchlight	(CLT)	Breakpoints	(BRKP)
Luminosity	(LUM)	EDG data	(EDG)
Neutral Tone	(NTON)	USM data	(USM)
Permanent Tone Boosts	(PTBS)	Pastel Boost	(PSCR)

All are contained in each CV block. Three CV blocks are available. Thus you can store three sets of values for each function (e.g. three CC sets, three GBAL sets, etc.).

The operator can call up a complete CV or BV block for use in a job. Values used for a job are called Job Values (JVs). Alternatively, the operator can take values of individual functions from different CV blocks, as well as from the BV block, for use in the JV block.

The BV block is coded CV0. The CV blocks are coded CV1, CV2, CV3 e.g.

Colour correction values taken from CV1 are coded CC1

Catchlight values taken from CV3 are coded CL3

Grey balance values taken from CV0 (BV) are coded GB0 etc..

When values from BV and CV have been transferred into JV, they can be edited. The edited values can then be stored in CVs if required, overwriting the values previously stored. (Tone edits should be stored as Permanent Tone Boosts using CAL 10.

The Alphanumeric Display always shows job values, but does not indicate whether they are edited or not. Therefore edited values should be noted when generated, for future reference.

Note: That you **cannot store** Job Values in the BV block (CV0).

You can store new values for all of the CV functions, by using the appropriate CAL procedure. It is possible to store an individual function in most cases, or alternatively store all functions as a block, in any one of the three available CV blocks. The recall procedure works in a similar fashion. It can be done either as a complete CV block or as an individual function selected from CV0, CV1, CV2 or CV3 (e.g. CC from CV2, GB from CV1, TONE from CV3, etc.). The Recall number/Store number relationship for each function is 1XY/2XY.

5.7.1 Storage Procedure

To store a function,

Press: [CAL]

Enter: **nnn**

Press: [ENTER]

```
4@ 1.00 50 150
STORE ..... BLOCK ?
```

The CAL numbers for the various set-up functions that can be stored in a CV are:

213	for grey balance
212	for colour correction
214	for PCR
201	for output calibration
217	for catchlight
253	for luminosity
210	for permanent tone boosts
216	for CAST 1
215	for CAST 2
218	for limits
211	for black printer
220	for breakpoint
219	for EDG data
258	for USM data
263	for pastel boost
256	for vignettes
230	for full CV block
240	for register mark data

Select the CV block required (i.e. 1, 2 or 3),

Press: [ENTER]

```
4@ 1.00 50 150
OVERWRITE CV Y/N ?
```

Respond:

This will store the JV data in the appropriate CV block.

Note: An individual function or the full set can be stored. Any entry using CAL 230 will overwrite **all** CV functions in the CV block chosen for storage.

The diagram below shows the scanning data storage areas and the flow paths between them.

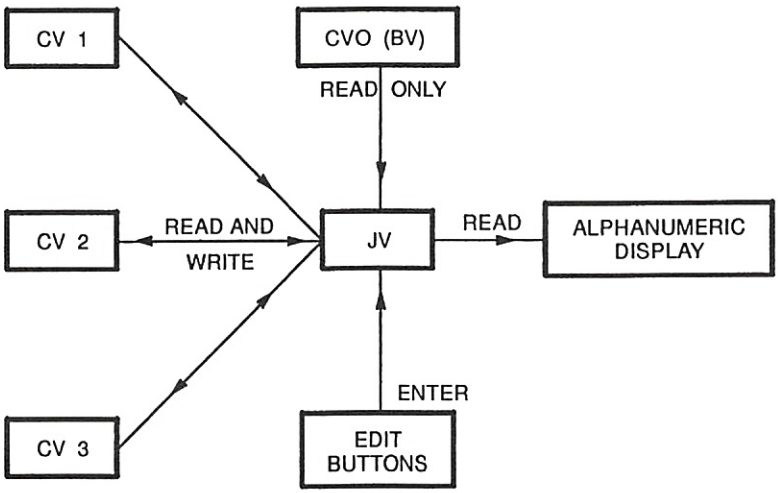


Figure 5.8 Data Storage and Flow Paths

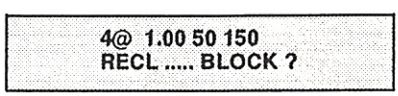
5.7.2 Recall Procedure

To recall a function

Press:

Enter: **nnn**

Press:



The CAL numbers for the various set-up function that can be recalled from a CV are:

1 1 3	for grey balance
1 1 2	for colour correction
1 0 1	for output calibration
1 1 4	for PCR
1 1 7	for catchlight
1 5 3	for luminosity
1 1 0	for permanent tone boosts
1 1 6	for CAST 1
1 1 5	for CAST 2
1 1 8	for limits
1 1 1	for black printer
1 2 0	for breakpoint
1 1 9	for EDG data
1 5 8	for USM data
1 6 3	for pastel boost
1 5 6	for vignettes
1 3 0	for full CV block
1 4 0	for register mark data

Enter the number of the CV block you require (i.e. 0, 1, 2 or 3).

To recall the data from BV/CV to JV:

Press: ENTER

Note: An individual function or the full set can be recalled.

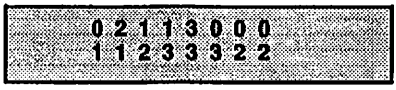
Any recall using CAL 130 will recall **all** functions from the chosen CV block.

5.7.3 Set-Up Function Values

There are three CAL numbers which provide information about the Job Values used in scanner set-up.

CAL 30

When this CAL number is entered, the Alphanumeric Display will list the last-used BV or CV blocks for each function, in a single display.

For example: 

means:

FUNCTION	CV USED IN JV	
Grey Balance	0	(BV)
Colour Correction	2	(CV2)
Output Calibration	1	(CV1)
Polychromatic Colour Removal	1	(CV1)
Catchlight	3	(CV3)
Matrix Table	0	(BV)
Neutral Tone	0	(BV)
Permanent Tone Boosts	0	(BV)
Cast 1	1	(CV1)
Cast 2	1	(CV1)
Limits	2	(CV2)
Black Printer	3	(CV3)
Breakpoints	3	(CV3)
EDG Data	3	(CV3)
USM Data	2	(CV2)
Pastel Boost	2	(CV2)

To return to the monitor mode:

Press: ENTER

CAL 31

When this CAL number is entered, the Alphanumeric Display will step through the scanner set-up functions displayed using CAL 30, plus Vignettes. The BV or CV block in use (i.e. in JV) is indicated for each function in turn. A different BV/CV block can be entered in each case, if required. For example:

Press: CAL

Enter: **31**

(BV is in use)

To confirm and step to the next function,

Press: [ENTER]

(CV2 is in use)

To change the block in use, Select: **1**, **2** or **3**.

When a number is pressed on the keypad, the display will change. When **[ENTER]** is pressed, the selected CV is transferred into JV, overwriting the previous CV in use. If you do not wish to step through all functions, press **[STOP]**. The scanner will bleep once and return to the monitor mode.

This sequence does not indicate whether the CVs recalled into JV have been edited or not.

CAL 32

When this CAL number is entered, the Alphanumeric Display will indicate those functions which have **edited** values, i.e. non-BV or non-CV values.

The display steps automatically through the functions showing each for about a second. Finally, the scanner bleeps once and returns to the monitor mode. The functions which might appear in this sequence are those displayed with CAL 30, plus:

Vignettes	(VIGN)
Matrix Table	(MTBL)
Tone	(TONE)
Autobalance Targets	(A.B)

If none of the functions have been edited in the JV block, the scanner will bleep once and immediately return to the monitor mode.

5.7.4 Reduction of Loading-Time

The Dual Speed System Controller starts loading the 3D Look-up Table (LUT) immediately after the scanner has been initialized and also after any colour edits have been made. The loading of the 3D LUT is invisible to the operator, who can still be setting up the scanner whilst it is being done.

Features, used in colour editing, which, **do affect** the loading of the 3D LUT are:

PCR	Cast 1 and 2
Pastel corrections	Auto shadow neutralization
Colour corrections	Neutral selective tone boost
Grey balance	Black printer
Maximum print density	

The scanner spends the majority of the time, from the beginning of the scan cycle to when it actually starts scanning, in loading the 3D LUT. The operator, through the Dual Speed System Controller, can reduce job set-up time by entering any of the colour edits, listed in the previous paragraph, towards the beginning of the job set-up sequence followed by any of the features that do not affect the loading of the 3D LUT. Features **not affecting** the loading of the 3D LUT are:

Catchlight	Vignettes
Dot shape	Enlargements
Screen angles	Formats
Limits	Negative
Scan rate	Beam overlap
Luminosity curves	Autobalance
HL, MT, SH tone boost	Half speed
USM (CAL 508)	Screen trims

For a new scan where no colour editing is required, the 3D LUTs are not re-loaded. As a result CAL 36 (No new Set-up) **is redundant**.

Suggested job set-up sequence for straight scans

A suggested sequence for optimizing the reduction of job set-up time is:

1. Power-up, (see Chapter 4).
2. Autobalance. It should be noted that Autobalance can be achieved without entering View mode.
3. EW and EB.
4. Colour edits.
5. Features **not affecting** loading of the 3D LUT with the exception of Autobalance.

5.7.5 Clearing Job Values

CAL 900 is used to reset the scanner without turning off the power. It is of use if the scanner memory has become corrupted. Enter **[CAL] 900** to initiate the reset sequence. The previous JVs will be cleared.

New JVs can now be loaded from the CV or BV blocks and edited as required.

5.7.6 Clearing Customer Values and Job Values

CAL 902 has a similar function to CAL 900 but in addition it clears the data from CV blocks. Enter **[CAL] 902** to initiate the reset sequence. The analyse display changes to:

```
CLEAR CV BLOCKS
CONFIRM? Y/N
```

To clear CVs and JVs, press **[YES]**. To abort the sequence press **[NO]**. If **[YES]** is pressed the display changes to:

```
ARE YOU SURE
CONFIRM? Y/N
```

Press **[YES]** to proceed or **[NO]** to abort.

When the sequence has been completed the BVs can be loaded into the CV blocks and each CV block can be edited as required.

5.8 LUMINOSITY CURVES

Luminosity values are calculated for three types of originals:

1. originals with a dark surround (35 mm etc.)
2. originals with a light surround (mainly reflection copy)
3. large transmission originals.

Average luminosity values have been calculated for the Basic Value program. These values, or other values at the customer's discretion, can be changed using CAL 505 and stored or recalled using CAL 253 or 153 respectively.

5.9 PRINT DENSITY

The Print Density data now provides a tone shape which takes into consideration the dot gain. Any additional tone edits needed to match the customer's requirements are made in the normal way on the scanner front panel edit controls. Average Print Density values have been calculated for the Basic Value program. Other values can be loaded by CAL 504, and stored or recalled by CAL 213 or 113 respectively.

5.10 GREY BALANCE (GB)

5.10.1 What Is Grey Balance?

A basic requirement of colour printing is to reproduce greys using C, M and Y inks. Three colour overprints of equal dot % values will produce brown, not grey (additivity failure). To reproduce grey the values for the scale have to be properly 'unbalanced' or 'grey balanced'. The extent of imbalance needed depends on the inks, press and paper used. This problem may not occur in gravure printing as the inks in use can be balanced.

5.10.2 Method

In order to simplify the method of determining Grey Balance and establish a repeatable procedure, which can also be used as a diagnostic reference, a test forme method of grey balance set-up is essential.

The test forme contains two distinct parts. One part consists of 10 blocks, each having a constant cyan dot (or density) with varying magenta and yellow. This is the part of the test forme for grey balance assessment.

Each block is divided into 25 separate areas by a grid printed in black ink. The purpose of this is to act as a neutral reference and is designed to have a density approximately the same as the neutral area formed by the three colour overprint. If the two are identical the tertiary grey and that produced by the black ink will be virtually indistinguishable from a reasonable viewing distance. This will then produce a simple reference as to which area is a tertiary neutral. However, this result is very dependent upon printing conditions. Nevertheless it still provides a very useful reference.

The grey balance is determined by choosing an area within each block which produces the closest to a visual neutral. It should be assessed under standard viewing conditions. Generally, individual observers disagree on the precise area because by its nature the proof has an array of areas all very close to neutral. However, the disagreement is rarely significant. If more than one observer makes the assessment an 'average' of their results may be used.

5.10.3 Grey Balance Set-up Procedure

The set-up procedure for Grey Balance is performed in the following sequence:

1. Examine the proof under 5000°K lighting, and from each of the ten blocks select and note a square which is most neutral in appearance (see Grey Balance test forme, Figure 5.9).
2. For the ten squares thus selected, record the dot % values of the cyan, yellow and magenta. A properly calibrated densitometer must be used to measure the exact values from the originally supplied separations, since the values listed in this guide are approximate.
3. Construct the cyan plot for the graph, as shown in Figure 5.10, using the 16 dot % cyan BVs found in CAL 13.
4. To account for the discrepancies on film, mark the actual ten cyan dot % values of the neutral patches recorded in (2) along the cyan BV curve.
5. Now plot the relative yellow and magenta percentages on film against the ten cyan points.

   Note: To ignore this consideration will result in the subsequent yellow and magenta derived values for CAL 13 being out of balance with the fixed cyan values.
6. Draw a smooth curve through each magenta plot and another through each of the yellow plots.
7. From the yellow and magenta curves thus produced, a dot % value for each step can then be derived and entered in CAL 13.

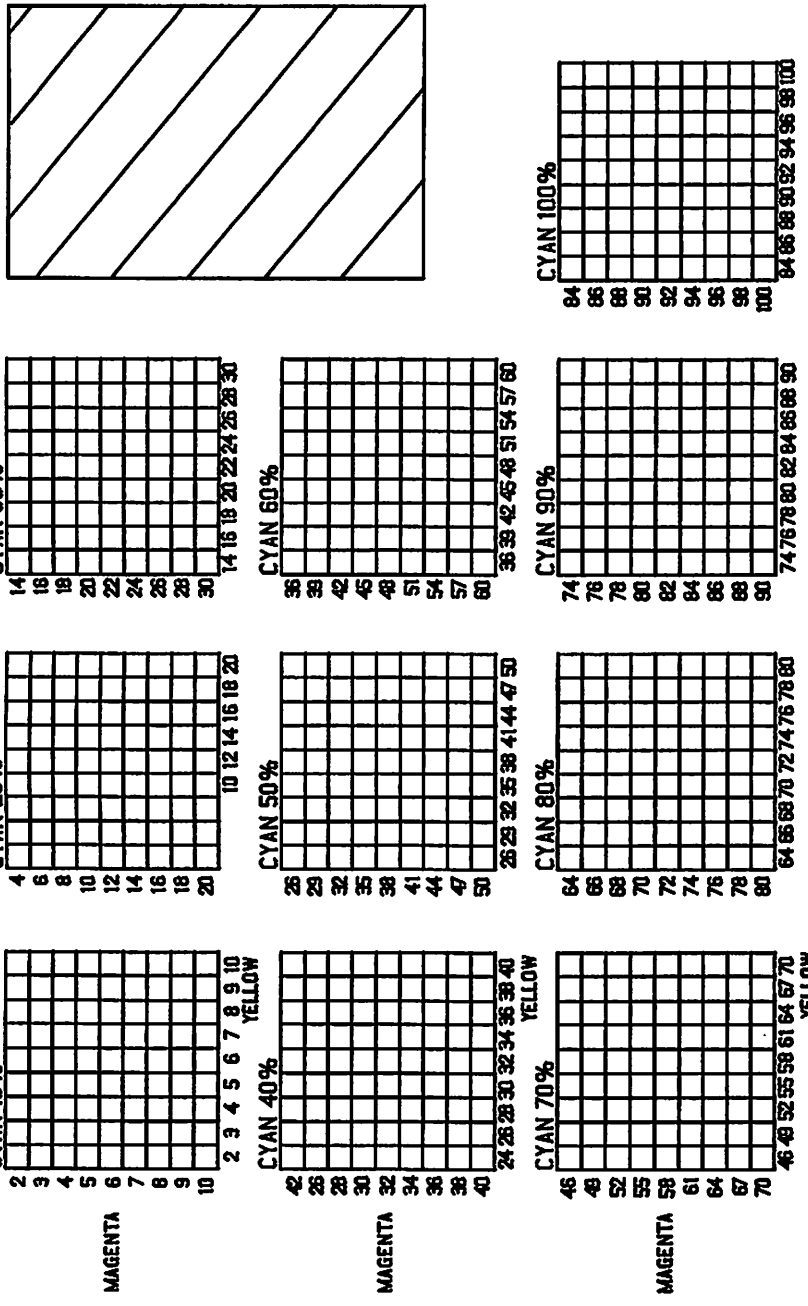


Figure 5.9 Grey Balance Test Forme

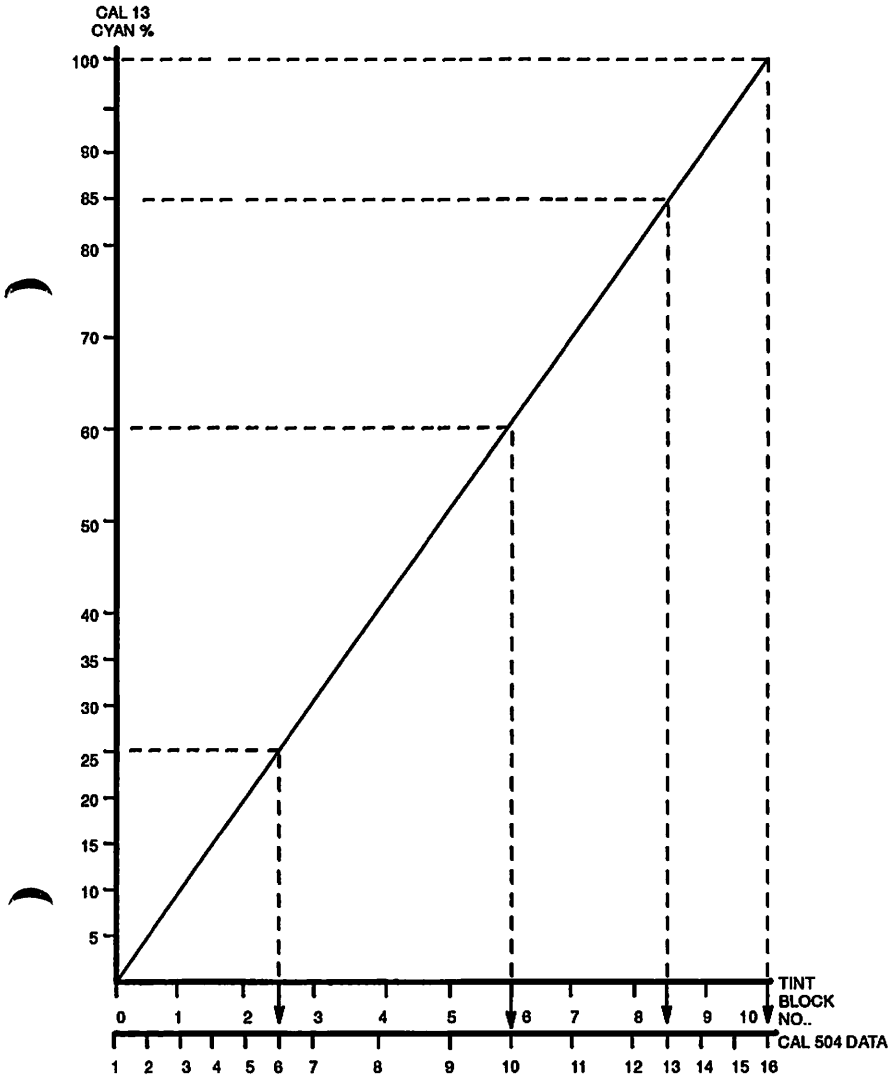


Figure 5.10 Grey Balance Graph for Print Density

5.11 BLACK PRINTER

The Black Printer functionality has been extended to allow increased editorial flexibility and, also, the calculation for the Black gradation curve is no longer based solely on information from the Cyan tone curve.

Nevertheless, the existing option to Enter White and Enter Black in the Black Channel is still a very acceptable method of setting the Black Printer for individual jobs.

The controls available allowing changes to be made to the Black Printer are:

Black Tone Boost - CAL 11 (Offset and Slope)

Black Grey Balance - CAL 514 (Black Curve Calculation).

These controls are localized in their operation and should be used in a logical order, as indicated in this sub-section.

Reference should be made to Figure 5.11, which provides the curves from which the logical step-by-step use of the black tone controls can be determined. Black Curve, Black Grey Balance and Black Tone controls are used in sequence, as described.

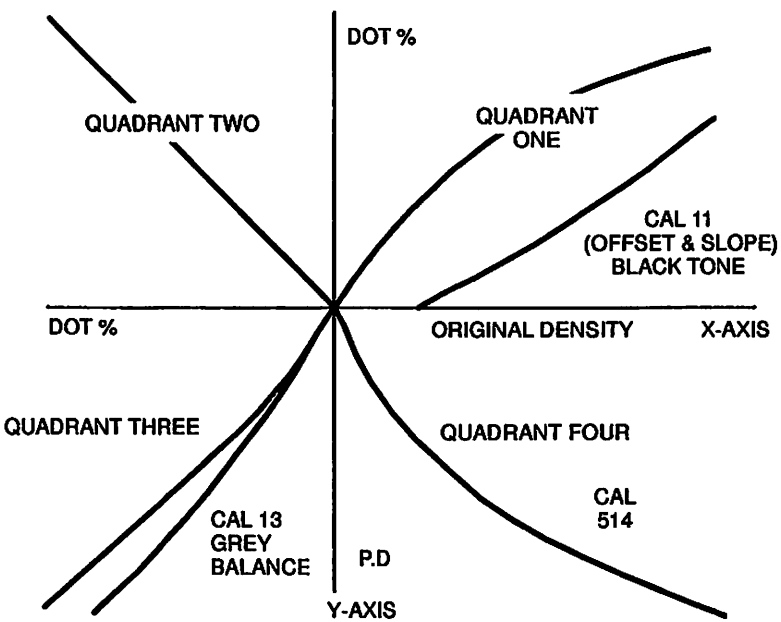


Figure 5.11 Black Tone Control Diagram

5.11.1 Black Curve

CAL 514 (Black Data)

Before carrying out CAL 514, first perform CAL 11 (Black Printer Data) with offset set to 0 and slope to 1.00 (Basic Values). CAL 11 operation is detailed under heading 'EW & EB and Black Printer' later in this Chapter.

The Black Curve is now produced by three values.

Values (a) and (b) necessitate taking reflection densitometer readings through the visual filter.

a) The grey-balanced tri-colour overprint density is the first measured value. This value is based on a Grey-balanced Overprint where the Cyan equals 100%. This means that if a Print Density (PD) Curve has been plotted, the first value for CAL 514 can be obtained from this graph.

   Note: The tri-colour overprint is **Not** Step 15 or 16 of the entered PD, because Cyan and Step 16 are extrapolated values. The tri-colour value entered must correspond to a 100% Cyan value in the overprint.

b) The Grey-balanced Overprint plus Black forms the second measured value. This value is obtained by measuring a patch made up of the same C, M, Y % dot values used for the tri-colour but which also has a Black overprint. The values entered should be the density of the known tri-colour values, plus the % dot of Black, which the customer would wish to see on such a Grey. For example, in an area having Cyan 100%, Magenta 84%, and Yellow 84%, a normal Black might be 70%. Therefore the tri-colour plus Black square consisting of 70% Black would be measured.

c) Additivity failure is defined as the inequality produced between adding the individual ink densities and measuring the combined ink density value. The value of additivity failure is the third figure required for the Black curve.

There is no theoretically correct value for the additivity failure due to the graphs not reaching a single point. The method to obtain the value is therefore by empirical derivation, which almost certainly entails CMYK changes being made. Any such changes to be made (within CAL 514) necessitate an Enter White (CAL 28) and Enter Black (CAL 29) being carried out. The action to be taken is as follows:

1. Perform Enter White with CAL 28 and Enter Black with CAL 29.

2. View the Black area on the transparency and adjust the third value (additivity failure) until the dot % selected for the Black in the Grey-balanced Overprint plus Black is achieved.

In the previous example, having performed Enter White and Enter Black, the values viewed on the Alphanumeric Display might be Cyan 100%, Magenta 84%, Yellow 84%, and Black 90%. The third value should then be adjusted until the Black dot % equals 70%, as required for that example.

CAL 11 (Black Data)

CAL 11 is now used to determine the start and finish points of the Black curve whose shape has been set by CAL 514.

If the Black appears too close to the highlight then an offset may be inserted in CAL 11. If this is done then it will be found that the Black will lack density at the shadow end. This may be altered by adjusting the CAL 11 slope.

5.11.2 Black Grey Balance

Whilst CAL 514 determines the Black by taking into account the ink densities, the final shape of the curve may still not be exactly that required. Using the logical sequence of making changes, the Black gradation can be changed by CAL 13 (Grey Balance) in the Black Channel. The advantage of CAL 13 is that it allows 14 working points of change to be made to the curve, two of which are extrapolated. However, a quadrant diagram has to be plotted to make such changes to the curve. This adjustment will not usually be required by the customer.

5.11.3 Black Tone

Black Tone control now includes Highlight and Shadow in addition to Midtone. The function uses the same Tone envelopes as normal Tone. The operating sequence is:

Press: TONE

Enter: B

Select: HL , MT or SH

To adjust CV, use: or , or enter **n**.

To leave the function, press again.

5.12 ENTER WHITE AND ENTER BLACK

The Magnascan is designed to be operable as a 'two-button' scanner. That is, it can perform facsimile reproduction of transparencies or flat copy using **[ENTER WHITE]** and **[ENTER BLACK]** together with one of the following:

MANUAL

for manual setting of dot % in HL and SH;

AUTO

gives partial neutralization of casts in HL and in SH. Automatically sets the dot % to pre-determined levels for black and white;

AN

gives total automatic neutralization of casts in HL and SH. This neutralization process selects areas of nominally neutral density. It does not affect colours.

5.12.1 Methods of Entry

In most cases EW and EB are entered when the analyse head is pointing at the appropriate area of the original.

Alternatively, pre-determined values of HL aim point and/or SH aim point can be entered via the keypad, regardless of whether the original is on the cylinder.

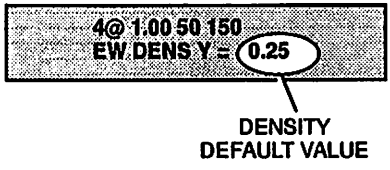
This facility is useful when special effects are required or to speed the scanning process for a series of similar transparencies.

5.12.1.1 EW Procedure (CAL 28)

Press: CAL

Enter: **28**

Press: ENTER



To change the value, Enter: **nn.nn** and Press: [ENTER]

or

To step to M,

Press: [ENTER] only

To change the value, Enter **nn.nn** and press [ENTER]

or

To step to C,

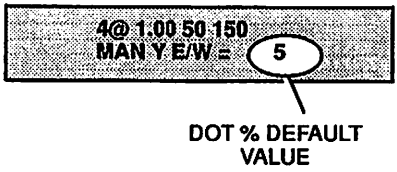
Press: [ENTER] only

To change the value, Enter: **nn.nn** and Press: [ENTER]

or

To step on,

Press: [ENTER] only



To change the value, Enter: **nn.nn** and Press: [ENTER]

or

To step to M,

Press: [ENTER] only.

The button/display sequences for M and C entries are similar to those for Y.

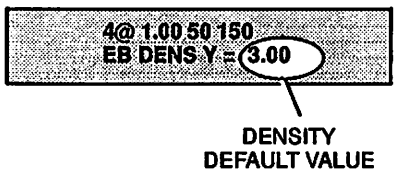
To step through the sequence, Use: [ENTER] or [▽]

5.12.1.2 EB Procedure (CAL 29)

Press: [CAL]

Enter: **29**

Press: [ENTER]



The button/display sequences for EB entries are similar to those for EW.

Note: The last-used values for HL and SH aim points are stored in scanner memory. These values will be used for subsequent jobs unless/until you enter new values.

5.12.2 Use of EW and EB to Achieve Facsimile

There are three ways to Enter White and three to Enter Black.

To obtain scanner facsimile,

Press: [MANUAL] then [ENTER WHITE]

To obtain partial neutralization of HL casts,

Press: [AUTO] then [ENTER WHITE]

To obtain total neutralization of HL casts,

Press: [AN] then [ENTER WHITE]

To obtain scanner facsimile, retaining any shadow casts,

Press: [MANUAL] then [ENTER BLACK]

To obtain scanner facsimile,

Press: [AUTO] then [ENTER BLACK]

This automatically selects the highest original density and gives the automatic black level in that channel. Levels in the other channels are scaled similarly, to maintain inter-channel differences.

To obtain total neutralization of SH casts,

Press: [AN] then [ENTER BLACK]

This can give unwanted neutralization of dark near-neutrals if those are predominantly the same colour as the cast being neutralized.

Note that GB is applied to all output dot %. This is an automatic facility which compensates for deficiencies in inks, etc. The effect that GB has on dot % is to reduce M and Y signals. This should be remembered when assessing the results of any EW or EB procedure.

5.12.3 Operation

5.12.3.1 Manual Enter White

When the scanner is in the original density (ORIG) mode, with the analyse head aimed at the first printing tone, the current value display will give the density values for Y, M and C as seen by the scanner.

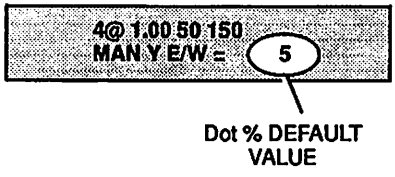
Select the lowest channel from Y, M and C (not B). Enter the dot % required in that channel. The remaining two channels will be automatically adjusted to give scanner facsimile at that entry point.

It is not essential to select a dot % to enter for that point. The scanner will enter a default value in the channel selected if no keypad entry is made.

Select lowest channel (Y, M, C, or B) and enter default value:

Press: [MANUAL]

Press: [ENTER WHITE]



Press: [ENTER]

The default value is a pre-programmed EW value. The value relates to the standard dot % for the first printing tone. The default value can be overridden, using the keypad, as follows:

Select lowest channel (Y, M, C, or B)

Press: [MANUAL]

Press: [ENTER WHITE]

Enter: **n** This dot %value overwrites the default value and is retained.

Press: [ENTER]

Note: If the scanner is in the manual mode with the desired colour already selected, the **[MAN]** and **[Y]** or **[M]** or **[C]** buttons need not be pressed again.

5.12.3.2 Automatic Enter White

AUTO EW will always change the HL values of copy so that any cast is partially removed. It differs from MAN EW in that Y, M, C do not have to be selected, but the default and keypad rules are the same.

AUTO EW always selects the lowest channel and deposits the default value or a keypad value in that channel. It adjusts the two remaining channels accordingly to give partial neutralization of any cast.

To obtain the default value,

Press: [AUTO] then [ENTER WHITE] then [ENTER]

To change the value,

Press: [AUTO] then [ENTER WHITE]

Enter: **n** This value overwrites the default value and is retained.

Press: [ENTER]

5.12.3.3 Automatic Neutral Enter White

Automatic Neutral Enter White (AN EW) will always neutralize any HL cast. If there are already visual neutral tones in the picture, use of AN EW to remove a cast will cause those neutrals to be rendered non-neutral and will partially neutralize pastel tones. AN EW is effectively a 'two-button' control for cast removal to give facsimile as you may expect a neutral to appear.

AN EW reduces the tone in the two highest channels so that all three channels are the same value, and then applies GB. The value chosen is either the default value or an operator value entered via the keypad. The value will appear in the display's C channel after entry. If you suppress GB, all three channels will have the same value (use **[SUPP EDIT]** when no Edits are being used, to display dot % without GB).

To obtain the default value,

Press: [AN] then [ENTER WHITE] then [ENTER]

To change the value,

Press: [AN] then [ENTER WHITE]

Enter: **n** This value overwrites the default value and is retained.

Press: [ENTER]

5.12.3.4 Manual Enter Black

For scanner facsimile, when C channel is the highest original density for the SH aim point,

Press: [MANUAL] then [ENTER BLACK]

Press: [C]

Press: [ENTER]

The other two channels are automatically adjusted and all channels are grey balanced.

As in MAN EW, there is a default value for MAN EB, which can be overridden using the keypad. The default value is preset. It can be changed using CAL 21.

5.12.3.5 Automatic Enter Black

AUTO EB should be used when Y or M channels are highest in order to achieve scanner facsimile (remember, it was MAN EB when C channel was highest). AUTO EB will deposit the default value or the keypad value in the highest channel regardless of which channel is selected, other than BLACK (B).

BLACK must not be selected when setting AUTO

The other two colour channels are adjusted accordingly and all channels are grey balanced. The Black Printer is automatically adjusted but may be altered using MAN B after Y, M C, EW and EB are set.

To obtain the default value,

Press: [AUTO] then [ENTER BLACK] then [ENTER]

To change the value,

Press: [AUTO] then [ENTER BLACK]

Enter: **n** This value overwrites the default value and is retained.

Press: [ENTER]

5.12.3.6 Automatic Neutral Enter Black

Automatic Neutral Enter Black (AN EB) will always neutralize any SH cast. All of the colour channels are brought to the same value and then grey balanced. This can be compared to an operator looking at copy and seeing a brownish, bluish, greenish shadow etc. which in graphic arts terms would be produced as black, with the C, Y, M balanced to provide that effect. AN EB neutralizes shadow areas, not coloured areas. It is neutral-selective.

Any area that is neutral before use of AN EB will be rendered non-neutral after AN EB. Also, when neutralizing for example, a dark green shadow, other very dark greens will be neutralized or partially reduced in greenness, but a medium-tone green area will not be affected.

The Black Printer is automatically adjusted but can be altered using MAN EB after Y, M, or C EW and EB have been entered.

To give a totally neutralized result at the SH end.

Press: [AN] then [ENTER BLACK] then [ENTER]

Use of a keypad entry of AN EB is not recommended. Either the scanner will disregard the keypad entry or tone distortion will occur.

5.12.3.7 'Two-Button' Scanner Operation

Manual (MAN) entries can be made for any channel, but to achieve a 'two-button scanner facsimile' result,

Press: [MANUAL]

Select lowest channel,

Press: [ENTER WHITE] then [ENTER] then [MANUAL]

Select Cyan (highest channel),

Press: [ENTER BLACK] then [ENTER]

Any MAN entries for a Y, M or C shadow value can be made provided that the appropriate channel is selected. The other two channels are adjusted automatically according to their original (ORIG) density relationship to the channel selected.

5.12.4 EW & EB and Black Printer

The Black Printer is produced automatically by operation of EW or EB with a colour channel selected, without further operator intervention. Two ways are available to change the start and end points of the Black Printer.

a) If the Black Printer needs to be altered for one job only, use MAN EW and MAN EB in the Black channel.

b) If the Black Printer needs to be changed permanently, use the CAL 11 and Black HL/MT/SH-TONE together with the CV recall and storage blocks (CAL 111/211).

The CAL 11 facility has two parameters,

1. The 'Black Offset' which determines the starting point of the Black compared to the cyan.
2. The 'Black Slope' which determines the upper end of the Black tone shape in relation to the cyan.

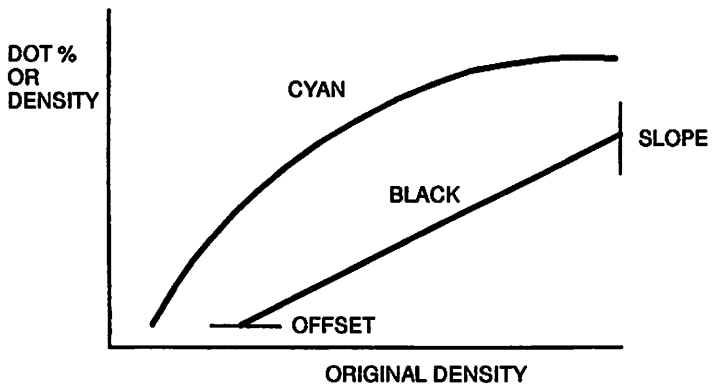


Figure 5.12 Black Printer Curves

For intermediate changes,

Press: MANUAL

Select: B

and enter the required values of EW and EB.

The Black Printer cannot exceed the maximum C shadow dot % unless MAN EW or MAN EB is used. Any later entry of EW or EB in Y, M or C will restore the automatic Black Printer image even if you have entered a modified black. Offset and slope will return to the last-used CV.

For permanent changes to the Black Offset,

Press: CAL

Enter: **11**

Press: [ENTER]

BLK OFFSET = 0.20

To change the offset,

Enter: **nn**

Press: [ENTER]

BLK SLOPE = 0.20

To change the slope,

Enter: **nn**

Press: [ENTER]

To change to the black mid-tones,

Press: [TONE]

Select: [B]

All the Black Printer data (CAL 11 and HL/MT/SH - values) can be stored as a Customer Value (CAL 211).

5.13 TONE

5.13.1 What is Tone?

Tone is a retouching feature of the scanner that is used to change the nature of the printed results. Using this facility you can make changes to the tonal values. You can increase or decrease the contrast or detail in the scanned subject. In other words, the Tone facility alters the tone shape.

5.13.2 What It Does

Changes can be made to HL, MT or SH in any combination. Tone affects all colour channels simultaneously.

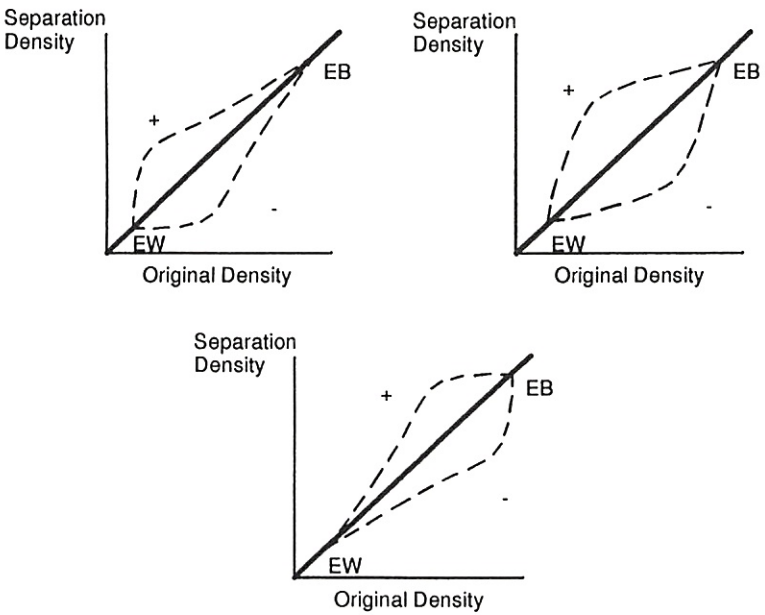


Figure 5.13 TONE Curves (HL, MT and SH)

Changes can be made using the INCREASE or DECREASE buttons [Δ] and [∇]. The displayed current values change whilst the buttons are pressed, until the maximum possible change has been made.

The numbers shown on the Alphanumeric Display are Index numbers. These relate to changes in dot % as shown in Table 5.1. Note that the change in value shown relates to the point of maximum effect of the particular Tone control.

Table 5.1 Effects of Change in Tone Index Numbers

Tone Area	Effect of Change of 1 Index Number at Point of Max Effect
Highlight (HL)	1%
Mid Tone (MT)	2%
Shadow (SH)	1%

At first, use [Δ] or [∇] and watch the Current Value display until the desired change is achieved. In time, you will be able to judge the increase or decrease needed in terms of the Index number. This can then be entered directly via the keypad.

Tone adjustments use the EW and EB points as pivot points. The values of dot % at these points are not affected by the Tone facility. (This does not hold if a very steep tone curve is used or if the EW point is non-neutral.)

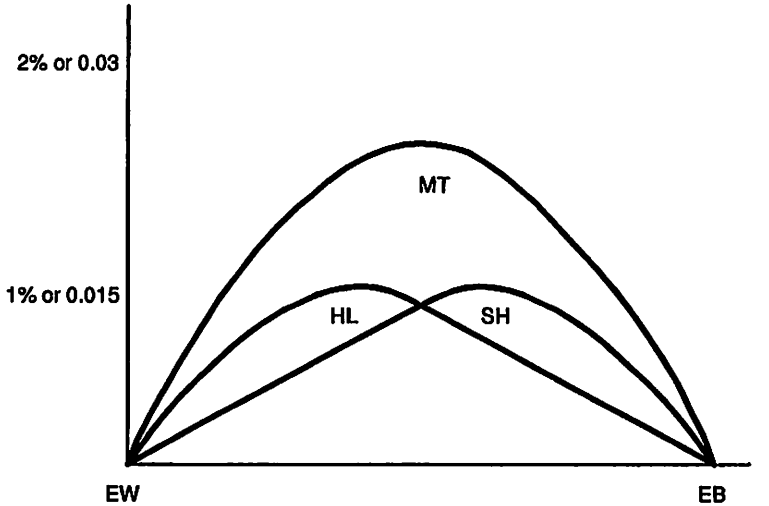


Figure 5.14 TONE-Effective of Change of One Index Number

The scanner will try to scan any curve you select. If you try to use a Tone control to produce an unnatural or illogical Tone curve, the scanner will alter this entry to give the maximum permissible Index number for the change you want to make. The scanner will bleep three times.

5.13.3 Where To Use It

Altering the Tone curve in one area will result in changes elsewhere in the curve. Table 5.2 shows what effects each Tone control function has in different tonal areas. The table should be compared with the graphs in Figure 5.13.

Transparency quality and customer's specification largely determine the changes that should be made to the Tone curve.

Table 5.2 Effects of Tone Settings

Tone Set	Effect on HL Dot %	Contrast	Effect on MT Dot %	Contrast	Effect on SH Dot %	Contrast
HL +	Higher	More Detail	Higher	Minimal Change	Slightly Higher	Slightly Less Detail
HL -	Lower	Less Detail	Lower	Minimal Change	Slightly Lower	Small Increase Detail
MT +	Higher	More Detail	Higher	More Detail	Higher	Less Detail
MT -	Lower	Less Detail	Lower	Less Detail	Lower	More Detail
SH +	Slightly Higher	Slightly More Detail	Higher	More Detail	Higher	Less Detail
SH -	Slightly Lower	Slightly Less Detail	Lower	Less Detail	Lower	More Detail

Table 5.3 gives a general indication of how to use the controls.

Table 5.3 TONE - Examples of Use

Over Exposed Subject (thin transparency)	HL+ MT+SH+
Under Exposed Subject (dense transparency)	SH- MT- HL-
Improve White Garments	HL+
Improve Snow Scenes	HL+
Improve Flat Subjects	SH- HL+
Improve Detail Overall	SH- HL+
Improve Shadow Detail	SH-
Improve Midtone Detail	HL+ MT+
Remove Detail Overall	SH+ MT- HL-
Heavier Result Overall	HL+ SH+

5.13.4 Operating Sequence

To adjust CVs,

Press: [TONE]

Select: [HL], [MT] or [SH]

Use: [▽], [△] or Enter: **n**

To leave the Tone function,

Press: [TONE] again.

Note: Any Tone edit can be recorded as a Permanent Tone Boost in a CV. It is recommended that the value is entered through CAL 10. Only CAL 10 values should be recalled/stored as CVs (CAL 110/210).

5.14 NEUTRAL TONE BOOST

C, M and Y channels are affected simultaneously by this function, similarly to the conventional tone control.

To access this facility,

Press: [TONE] then [ ]

To select the tonal region to be adjusted,

Select: [HL], [MT] or [SH]

Selectivity of the tonal region is governed by the Tone Envelopes provided in Section 5.13 for the conventional Tone controls. Tone control is biased towards neutrals, although the selectivity is variable.

To adjust the selectivity of the Neutral control, now continue.

Press: [CAL]

Enter: **25**

Press: [ENTER]

To proceed through the CAL 25 sequence to Step 4 (appearing on lower line of Alphanumeric Display).

Press: [ENTER] or [ ]

Enter: **n**, the required value.

To apply change of selectivity to Neutral tone,

Press: [ENTER]

To return to standard monitor mode,

Press: [TONE]

5.15 COLOUR CORRECTION

The six colour correction buttons are the colour retouching tools. They can be used for the following purposes:

1. To make changes in parts of the original that are not the correct colour.
2. To make changes in parts of the original which would otherwise reproduce poorly because of the type of original or the behaviour of certain colours in the original.
3. To change the overall colour correction information in the scanner to suit different inks.
4. To install new colour correction Customer Values (CVs), or to change existing ones.

5.15.1 Selection of Appropriate Controls

The colour correction buttons specify which colour in the original is to be adjusted and they are used singly in Y, M, C or B channels. The Y, M, C or B channel select buttons specify the printer which is affected by that adjustment.

The colour of the button that you use should be the nearest match to the colour that you are monitoring, e.g. to reduce magenta in greens you would monitor the green area and select the Green button and M channel. To increase yellow in greens you would monitor the green area and select the Green button and Y channel.

If you try to make an 'illegal' correction (e.g. monitoring a green area and trying to select a new % dot value in the C channel using the red colour correction button), the scanner will bleep three times and an error message will appear on the Alphanumeric Display:

Note: The above applies to direct entry of % dot values but not to the use of Increase or Decrease buttons.

5.15.2 To Enter The Change

Press:

Enter: **Y M C** or **B**

Select: Red [HL] Yellow [HT] Green [SH] Cyan [PCR] Violet [CL] Magenta [↙]

Enter: **n**

Press: [ENTER]

or Use: [Δ] or [∇]

Colour correction is denoted on the display by 'CC' followed by the channel changed and then the original colour adjusted. Changes made are displayed as index numbers. The example shows that a **Colour Correction** (CC) value of **0.9** has been applied to **reduce** (-) the amount of **magenta (M) ink** in **yellow (Y) areas**.

Using [Δ] or [∇], causes the Index number to change. Observe the Current Value Display and release the button when the appropriate value of dot % is reached.

Entry via the keypad can be made in dot %. The Alphanumeric display will show the dot % figure until **[ENTER]** is pressed. Then the Alphanumeric Display will change to an Index number.

Note: No warning is given in the Alphanumeric Display if you try to set up an excessive value of Index number. You must check the displayed Index number yourself. The Index number should **never exceed 1.50**. Too large an edit value will produce gross colour distortion in the picture.

To see what change you have made,

Press: [SUPP EDIT]

This will temporarily suspend the selected colour correction edit to show the value before edit was applied.

Press **[COLOUR]** once to enter the colour correction mode. Press it a second time to exit from the colour correction mode.

Any combination of colour correction settings you make can be recorded on one of your CV blocks (CAL 212).

5.15.3 Colour Correction and Installing CVs

5.15.3.1 Colour Correction

A good colour correction can only be achieved in calculated steps over a certain period of time. Observe the following rules:

a) Under no circumstances should the colour correction be judged from results that have received selective editorial colour or tone changes.

b) Changes in tone, grey balance, cast etc., will alter the colour correction (a point often overlooked).

c) Do not judge the colour correction achieved on one subject only, but have as many jobs as possible proofed to get your final setting.

d) Avoid frequent changes of colour correction as this will only cause confusion resulting in an incorrect assessment of the real problem.

e) Always make the Black colour correction after the C, M and Y channels have been adjusted. (Changes in C, M and Y will also result in changes to the Black).

f) Remember that the colour correction is interactive, particularly if it is made to a dirty colour e.g. olive, brown, etc..

g) Make the correction on a normal range transparency.

Note: A long/short range transparency or reflection copy may not give you the right colour correction. A long range transparency tends to have over-saturated colour correction and a short range transparency undersaturated.

5.15.3.2 New Colour Correction CVs

1. Mount the Crosfield Colour Patch on the small cylinder, emulsion up and focus on clear cylinder to give repeatable and uniform readings.
2. Select analyse aperture 2, filter B.
3. Perform an autobalance, then EW on the white patch (e.g. 5% in C) and EB on the black patch (e.g. 95% in C).
4. Use the colour correction edit facility to adjust the different colour patches.
5. When all the changes have been made, check all the different patches to ensure that changes made in one value have not affected other values.

6. Scan several jobs to verify the changes.
7. When the full set has been verified, the new set should be loaded into CV, using CAL 212. Enter all the alterations into the Log Book.

5.16 PASTEL COLOUR BOOST

This editorial control affects all colours of limited saturation whilst leaving neutrals and highly saturated colours unaffected. It is calculated from the highest dot % after removal of the neutral component and thus approximately depends upon the difference between the highest and lowest of the three dot %.

It affects both light and dark colours of low saturation but the effect is greater on pastel colours. The control affects colours where the difference between the highest and lowest is below 40% with the greatest effect at approximately 15%.

5.16.1 Colour Boost: All Colours

Press: [COLOUR]

Press: [ ] PASTEL R 0.0

To apply to all colours simultaneously, Press: [B]

Select a 3-digit decimal factor between 0.00 and 2.00 for the proportion of pastel boost required (BV = 0.20) and

Press: [ENTER]

Repeat the above procedure until the desired amount of dot % is achieved in the higher two channels.

To return to the monitor mode:

Press: [COLOUR] twice.

5.17 SUPER PASTEL

5.17.1 Pastel Mode

The CAL 516 Pastel Mode facility allows selection of All Pastels, Clean Pastels or Dirty Pastels. It is normally applied before Pastel Boost.

Press:	CAL	
Enter:	**516**	
Press:	ENTER	
To select	All Pastels,	Enter: **0**
	Clean Pastels,	Enter: **1**
	Dirty Pastels,	Enter: **2**
Press:	ENTER	

The pastel categories are:

Category	**Description**
All Pastels (Option 0)	Any colour which falls within the bounds of the pastel curve will be affected by a boost. This option is also the default condition.
Clean Pastels (Option 1)	Only colours with a low grey component will be affected by a boost.
Dirty Pastels (Option 2)	Only colours with a high grey component will be affected by a boost.

Note: Selection of clean or dirty pastels may require a higher boost factor to be applied than would otherwise be the case.

5.17.2 Pastel Curve

The pastel curve is equally applicable to all channels and cannot be varied for individual colours. The curve values defined in Table 5.4 may be called on the Alphanumeric Display by CAL 513, thus:

Press:	CAL
Enter:	**513**
Press:	ENTER

Table 5.4 Pastel Curve Values (CAL 513)

Pastel curve step	Curve values
1)	0.0
2)	1.43
3)	3.46
4)	2.12
5)	1.14
6)	0.68
7)	0.31
8)	0.11
9)	0.0
10)	0.0
11)	0.0
12)	0.0
13)	0.0
14)	0.0
15)	0.0
16)	0.0

5.17.3 Colour Selective Boost

Pastel boost is now colour selective. To apply the boost factor to a particular colour:

Press: COLOUR

Press: PASTEL R 0.0

Press: Red HL, Yellow MT, Green SH, Cyan PCR, Violet CL, Magenta

Select 3-digit decimal factor between 0.00 and 2.00 to apply pastel boost to selected colour and

Press: ENTER

Repeat the procedure for colour selective boost until the desired amount of dot % is achieved in the higher two channels.

To return to the monitor mode,

Press: COLOUR twice.

5.18 POLYCHROMATIC COLOUR REMOVAL

Polychromatic Colour Removal (PCR) is defined as 'the removal of the neutral component in any colour and its replacement by the black printer'.

When a colour is separated into its three component colours, the lowest channel, and equivalent levels of the other two colours, only affect the grey component of the colour. Using PCR will effectively replace this neutral colour with black and re-proportion the component colours to give the original colour. This means that when three colours are overprinted one of them will always be black.

For acceptable reproduction using PCR it is essential that grey balance is accurately set up for the appropriate printing conditions.

Once the scanner has been set up to the appropriate printing condition the following basic procedure can be used to specify the level of PCR required on a particular job.

5.18.1 Basic Operating Procedures

Setting PCR Using the Gain Method

Press:

Respond:

Enter a 3-digit decimal value between 0.00 and 1.00 for the proportion of PCR required (BV = 1.00) and

Press:

Setting PCR Using The Maximum Overprinting Method

For maximum overprinting of ink weights as a dot %, enter a 3-digit value for ink weight maximum dot %. Select PCR as described in the previous section, enter a minimum gain, 0.01, then proceed as follows:

Set up the scanning head on a solid tone, then:

Press:

Enter: **65**

Enter: **nnn**

Press: ENTER

The colour channel displays will count up until the required gain is reached.

5.18.2 Editorial Procedure

For editorial use the weight of black can be balanced with the weight of the colour under black.

Limiting Black

To increase or decrease the weight of black,

Press: CAL

Enter: **524**

Enter new value (BV - 1.00) and Press: ENTER

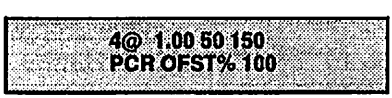
Repeat the above procedure until the desired weight of black is achieved.

Adding Three-Colour Under Black

Three-colour inks can be added to reinforce the black printer where additional density is required in shadow areas.

Press: CAL

Enter: **523**



Enter the break point as a dot % (BV = 100%) and

Press: ENTER

Repeat the above procedure until the desired weight of colour under black is achieved.

Note: It is recommended that CAL 524 be set before CAL 523.

5.18.3 Additional PCR Procedures

PCR Restricted to Highlights

The PCR gain reduces from the maximum value (unity) at the breakpoint, to zero at the dot % (positive value) selected by the operator. The breakpoint is set (by the system) to a dot % value half way between the operator value and 0% dot. A normal separation without PCR is produced at the shadow end.

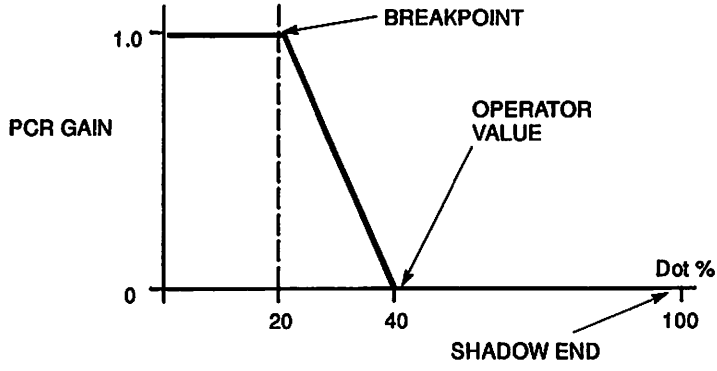


Figure 5.15 Reduction of PCR in Shadows

The sequence of operation is,

Press: CAL

Enter: **525**

Press: ENTER

```
4@1.00 50 150
PCR HLT  0
```

Enter a positive value of dot % up to a maximum of 100%, and

Press: ENTER

The scanner then returns to monitor mode.

PCR Restricted to Shadows

The PCR gain increases from zero at the dot % (negative value) selected by the operator to the maximum value (unity) at the breakpoint. The breakpoint is set (by the system) to a dot % value half way between the operator value and 100% dot. A separation without PCR is produced at the highlight end.

Note: Dot % values selected by the operator are entered as negative numbers.

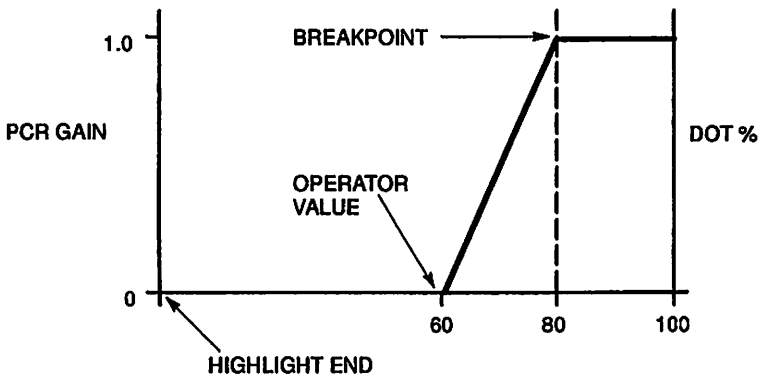


Figure 5.16 Reduction of PCR in Highlights

The sequence of operation is,

Press: CAL

Enter: **525**

Press: ENTER

Enter a negative value of dot % from 0 to -100 (%), and

Press: ENTER

The scanner then returns to monitor mode.

PCR Highlight Colour Modifier

The PCR Highlight Colour Modifier function removes colour from a specified dot % area. A two-value, dot % entry system is used to select the region to be affected. Once CAL 527 has been selected, the first value

specifies a point up to which a black-and-white result will be produced, all colour being removed. The second value specifies a point where the PCR colour is returned to normal. Colour is introduced progressively between the two values.

The sequence of operation is:

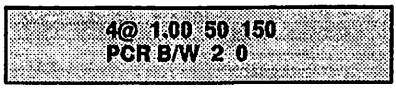
Press: CAL

Enter: **527**

Press: ENTER

Enter a dot % value (less than 100%), and Press: ENTER

The first value appears at the right of lower line on the Current Value Display.



Enter a dot % value higher than the first value, and

Press: ENTER

The modified dot % appears at the right of lower line on the Current Value Display.

PCR Black Modifier

The PCR Black Modifier function progressively increases or decreases the weight of the Black Printer to approximately 40% dot. It is advisable to check the shape of the black curve when using this function.

The operating sequence is,

Press: CAL

Enter: **528**

Press: ENTER

(typically)

Enter a dot % (up to 40%) then:

Press: [ENTER]

The modified dot % appears at the right of lower line on the Current Value Display.

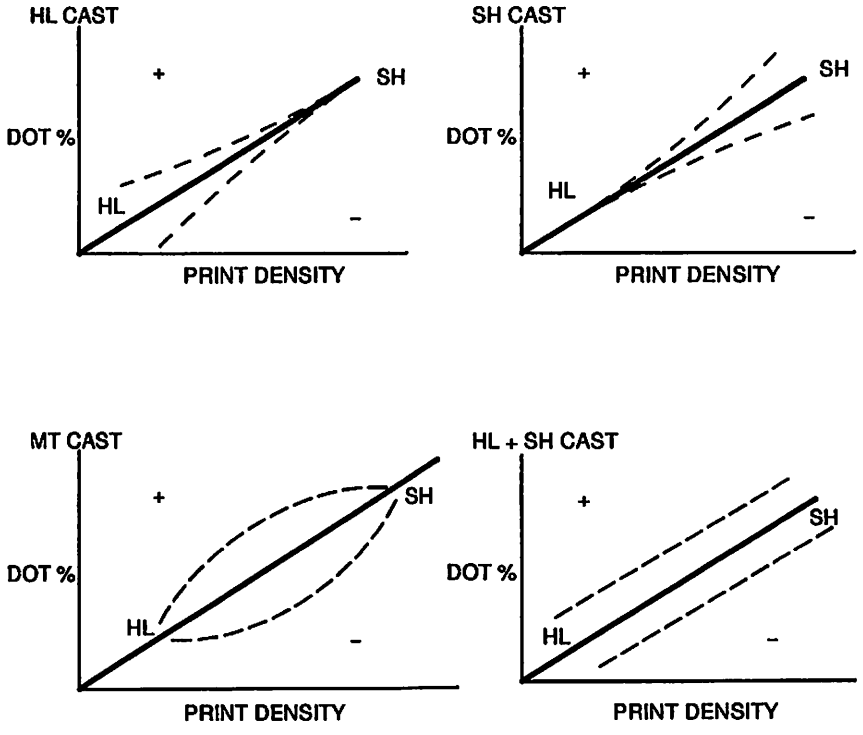
5.19 CAST

This is a retouching feature that is used to remove or introduce casts. It can also be used after scanning as a re-scanning or final correction tool; where a positive is found to be up or down in Y, M or C (after proofing for example). To correct the fault, set the scanner up to the JV previously used but apply Cast at the appropriate stage in the procedure. There are two Cast buttons which are both channel selective. Cast 2 must be used before Cast 1.

Cast 2 is used to remove or add Y, M or C individually to neutrals in the SH only, without affecting colours. For example, SH is too brown and needs C to make it nearer to neutral.

Cast 1 is used to remove or add Y, M or C casts independently in each colour channel, in the HL, MT and/or SH areas. It affects all areas of the subject simultaneously whether they are coloured or neutral. Note that a linear shift is achieved with the use of HL and SH Cast, (see Figure 5.17).

Graphs showing how Cast works,



Key to graphs

——————— The SEP dot % before use of Cast

– – – – – – – – – The effect of using Cast, (maximum effect)

HL = Highlight or first printing tone

MT = Mid tone

SH = Shadow tone

Figure 5.17 CAST Curves

5.19.1 Alternatives to CAST 1 and CAST 2

It is not necessary to use Cast unless:

- Use of EW and EB does not give the desired result.
- You wish to introduce a cast.
- You wish to remove an overall cast.

Remember that facsimile reproduction can mean:

- as the scanner sees it - scanner facsimile
- as the observer sees it - observer facsimile

To obtain scanner facsimile,

Press: MANUAL then ENTER WHITE

To obtain partial neutralization of HL casts, approximating to observer facsimile,

Press: AUTO then ENTER WHITE

To obtain total neutralization of HL casts, giving observer facsimile,

Press: AN then ENTER WHITE

To obtain scanner facsimile when C is highest in ORIG mode,

Press: MANUAL then ENTER BLACK

To obtain scanner facsimile when M or Y is highest in ORIG mode,

Press: AUTO then ENTER BLACK

To obtain total neutralization of SH casts, giving observer facsimile,

Press: AN then ENTER BLACK

5.19.2 Operating Sequences

Cast 2 must always be used before Cast 1.

Cast is placed near the end of the operating sequence so that:

1. It can be used as a retouching tool to correct work;
2. All of the edit functions interact properly;
3. If Cast is needed to adjust the Tone curve when the correct use of EW and EB has failed, Cast will not interfere with the other edit controls.

Suppose you wish to make obvious changes to an original, which cannot be achieved by use of EW and EB. Use the Cast edit immediately after EW and EB to produce the reproduction characteristic desired. Then, proceed through the other edit functions you wish to use. When you reach the Cast stage in the operating sequence check the transparency again and make any further adjustments necessary.

Cast 2

When you select **[CAST 2]** the scanner knows that the SH should be monitored. You do not need to select **[SH]**.

Press: CAST 2

```
4@ 1.00  50  150
SHD  Y  CS 2  0000
```

Select: **Y**, **M** or **C**.

Enter: **nn**

Press: ENTER

or Use: △ or ▽ until the required value is achieved.

nn = dot % change in the extreme shadows of the selected colour. The maximum change is 40%.

Cast 1

[CAST 1] must be entered separately for HL, MT and SH. You might use the buttons in the following order:

Press: CAST 1

```
4@ 1.00  50  150
HLT  Y  CAST  0
```

Select: , or

Select: **Y**, **M** or **C**.

Enter: **nnn**

Press:

or Use: or

nnn = the maximum dot % change in the selected tonal region and colour.

For Cast 1 at the HL, to affect two colour channels you might:

Press:

Select: and

Use: or

Select:

Use: or

Then: clears all Cast settings

clears Cast 1, HL and MT

clears Cast 1, SH and Cast 2 MT

To exit from the Cast mode,

Press: or again.

Cancelling Cast Edits

After leaving Cast it is possibly to cancel edits by pressing **[EB]** or selecting **[Cancel Edit]**.

5.19.2.1 How To Enter Cast Values

Suppose a transparency has a magenta cast. The customer requires the cast to be reduced slightly but not removed. Select the MAN EW mode to maintain the balance of the transparency and set the scanner mode to put 5% dot in the lowest channel at the first printing tone.

This might give: Y = 5% dot
M = 25% dot
C = 8% dot.

You think you should reduce the M value to 15%. You have already tried AUTO EW but not achieved the correct result.

You **cannot** reduce the M value directly from 25% to 15% by entering 15% on the keyboard. You must either use [Δ] or [∇] to enter the appropriate Index number.

Use: [∇] with M channel selected so that the M value falls. Stop when the value reaches 15%. The Alphanumeric Display will show an index number of about -10.

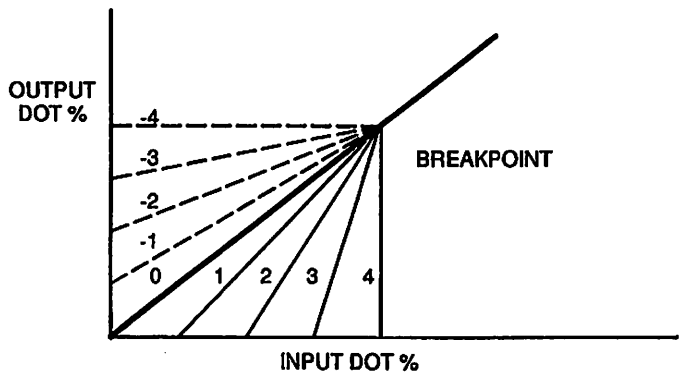
5.20 CATCHLIGHT (CL)

5.20.1 Function

The Catchlight (CL) control should be used to create highlight drop-out effects on small sparkly areas. It is not intended to be used to give a clean break from one HL tone to another in the same manner that a HL mask could be used in conventional graphic arts.

You can enter a CL value that will determine the lowest value of screen dot that will appear on film. Ideally that value will be equal to or lower than the lowest channel value at EW (so as to maintain the GB values for the EW point). CL will affect dot % on all tones that are below CL BP. Care should be taken not to introduce colour fringes (contouring).

Slope (SL) is the severity with which the CL will be applied.



Note: Slope index values are shown against relevant lines

Figure 5.18 CATCHLIGHT - Slope Curves

Slope index values for catchlight values are from 0 to 4.

0 = No SL, which renders CL inactive.

1, 2, 3, 4 = increasing levels of SL.

Using a SL of 4 will cause all screen dot to drop out below the BP that has been selected.

Slope index values -1 to -4 may occasionally be used for certain special effects.

5.20.2 Operation

Press: [C/L]

Enter the value for the lowest channel and

Press: [ENTER]

Enter the SL value and Press: [ENTER]

The Alphanumeric Display will revert to normal monitor mode.

To inspect BP or SL, without entering a value,

Press: [C/L] then [↙] or [↙]

Any CL setting can be stored as a CV, using CAL 217.

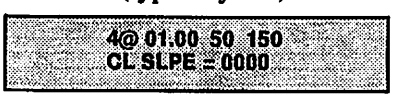
5.20.3 Channel Selective Catchlight

Catchlight colour selectivity for a specific channel applies only to slope. To access colour selectivity,

Press: [C/L]

(typically)

Enter the breakpoint value for the lowest channel (typically .05).



Press: [COLOUR]

Enter a slope value in range 0 to 4 (typically 3).

Press: [ENTER]

Define slope for Magenta and Cyan channels similarly as for yellow. After pressing **[ENTER]** for Cyan, the monitor mode is resumed.

Note: Catchlight will be applied to all channels, i.e. not selectively, if the **[COLOUR]** button is not selected.

5.21 LIMIT

The gravure process requires that there should be no density in the separations higher than a specified maximum density. A similar requirement often exists for web offset or letterpress. The Limit control cuts off the tone in a picture at a specified dot %.

Upper (SH) and lower (HL) dot % limits can be set. Applying Limit will prevent any dot % from being either above the upper limit or below the lower limit.

Individual limits can be set in one or more colour channels Y, M and C. Alternatively, common limits can be set in Y, M, C channels. Black limits are always set separately. It is not necessary to monitor the original in order to set limits.

If both **[SEP]** and Limit buttons are selected, the limit dot % values are shown on the Current Value Display.

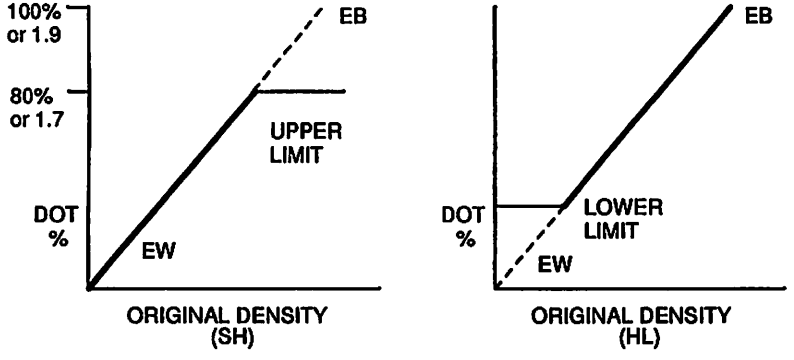
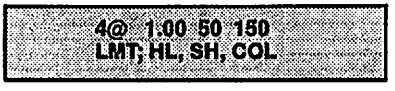


Figure 5.19 LIMIT Curves

5.21.1 Operating Sequences

Common Limits

Press:



To change the common HL Limit in C, M and Y:

Press:

This negative limit default value is set at a very low level so as to have no effect under normal operating conditions.

Enter the required dot %, i.e. for 5%.

Enter: **5**

To leave LIMIT mode, press: [ENTER]

To change the SH Limit in C, M and Y, use the same produce as above but press **SH** instead of **HL**. Note that the SH Limit default value is set at a high level so that it will have no effect under normal operating conditions.

HL and SH limits can be used simultaneously to produce tint blocks. If the SH limit is below the HL Limit the SH limit will override HL limit:

e.g. HL limit = 50%, SH limit = 45%, result = 45%.

To change the HL or SH Limits in Black, press **B** then the Limit button, then either **HL** or **SH**. Enter the Limit value in the same way.

Individual Limits

Press: [LIMIT] and [COLOUR]

Press: [HL]

To set a new limit in Y, i.e. 12%:

Enter: **12**

To step to M limit, Press: [ENTER] or [▽]

The sequence will continue through C and B limits. A similar sequence for SH Limits is followed if **SH** is pressed instead of **HL**.

5.22 LINE MODE

This mode is used if line work such as drawings or text is scanned. It is also used to create drop-out or burn-out masks and line boost masks.

A breakpoint (dot % value) is chosen by the operator. The scanner computer monitors the C,M,Y and B separation dot % values related to the picture area being scanned. Dot % values below BP are changed to a constant lower limit value. Dot % values above BP are changed to a constant upper limit value. The operator can choose these limit values using the LIMITS functions, (before using the LINE function). The upper and lower limit default values are 110% and -10%.

The picture signal output from the analyse unit has only two values, which correspond to the upper and lower limits of output dot %. A dot pattern is seen on separations only at the boundaries between high and low density areas.

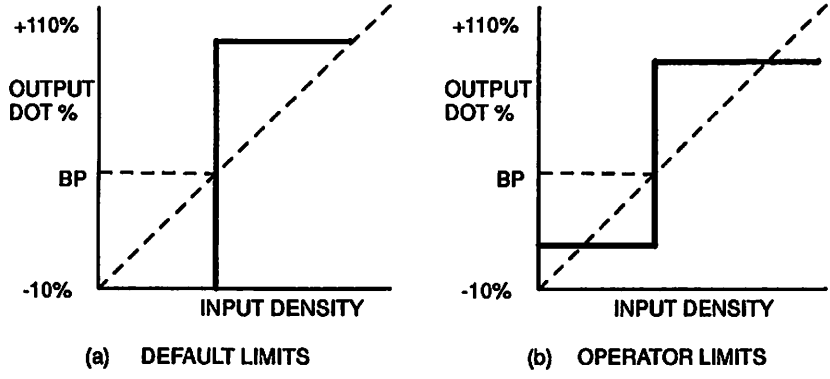


Figure 5.20 LIMITS

This facility may enhance detail in some areas of separation and remove it in others, depending on the BP and limits chosen. Experience will reveal the full potential of LINE mode. A BP of 50% dot and -10/110% limits will give clean line work.

5.22.1 Operation

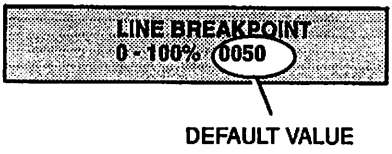
Note: If you have set limits for a previous job, which are not needed in Line mode, remove them first.

To enter Line mode:

Press: CAL

Enter: **509**

Press: ENTER



To enter the default value:

Press: ENTER

To change the BP value:

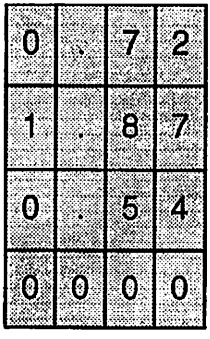
Enter: **nn**

Press: ENTER

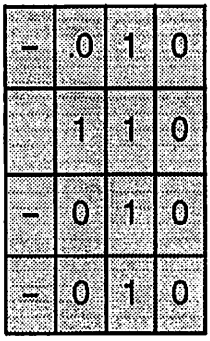
The displayed BP value changes as you use the keypad.

If SEP is selected, the Current Value Display will show the separation dot % in each channel, during exposure. The values will jump from the upper limit to the lower limit and vice versa, as the original density of the scanned area lies above or below the BP.

If **[ORIG]** is selected, the Current Value Display will show the original density in each channel, during exposure.



(a) **[ORIG]** selected



(b) **[SEP]** selected

5.23 EXPOSE

An exposure can not be initiated directly from the analyse unit. Refer to the Magnalink Operator's Manual, 6700-5600.

CHAPTER 6

CARE AND MAINTENANCE

CONTENTS

Section		Page
6.1	SYSTEM CARE	6-1
6.2	GENERAL CARE	6-2
6.3	CHANGING THE XENON LAMP AND TOP LEAD	6-3
6.3.1	Indications of Failure	6-3
6.3.2	Essential Notes on Safety	6-3
6.3.3	Replacement of a Failing Lamp	6-4
6.4	ROUTINE MAINTENANCE	6-8
6.4.1	Daily	6-8
6.4.2	Weekly	6-8

ILLUSTRATIONS

Figure		Page
6.1	Xenon Lamp Assembly	6-4
6.2	XLS Front Panel	6-6

CHAPTER 6

CARE AND MAINTENANCE

6.1 SYSTEM CARE

CAUTION

There must be NO SMOKING, EATING OR DRINKING in scanner rooms.

The equipment requires very little maintenance.

Daily

- Ensure that the environmental conditions are within the permitted ranges.
- Check the cleanliness of the area.
- Check that the cooling fans are operating properly.

6.2 GENERAL CARE

The Magnascan Plus analyse unit is designed to require minimal maintenance and servicing. Some parts of the scanner are sealed for safety and cleanliness and must not be touched.

The inside of the unit, under the lids, should be kept as free as possible from dust and dirt. The ventilation grilles must be kept clear to allow good ventilation.

The analyse unit will give best results if it is left switched on as much as possible, even overnight and at weekends. It is advisable to leave the analyse head pointed at an area of neutral density filter of approximately 0.9. This will extend the life of the photomultipliers.

Cylinders are manufactured to close tolerances and must be handled carefully to avoid damaging them.

Analyse cylinders are easily scratched, so it is strongly recommended that the operator removes any rings, cuff-links and watches that might come into contact with the cylinder. All hard or sharp objects such as combs, keys, etc., should be kept away from the cylinders.

Cylinder cleaning methods are described in Chapter 4. Ensure that the safety procedures are followed.

6.3 CHANGING THE XENON LAMP AND TOP LEAD

Note: It is possible that the lamp may burst in use. If this occurs the service engineer should be called to replace the lamp and rectify any further damage that may have been caused.

6.3.1 Indications of Failure

There are two main indications that the lamp is failing and must be replaced.

- If there are streaks on the film and it is certain that they are not caused by the film processing, the xenon lamp may be the cause.
- If there is insufficient light for autobalance, this is probably due to falling light output from the lamp.

In addition, if ozone is generated by a xenon lamp the lamp must be changed immediately. If this condition arises when a new lamp has been fitted, assuming it has been warmed up, ensure that the correct type has been fitted.

When streaking occurs and it is certain that it is not caused by the film processing or the xenon lamp, adjust the lamphouse optics as described in Chapter 4.

6.3.2 Essential Notes on Safety

Operators are expected to change the xenon lamp when necessary. This is a simple procedure but certain safety precautions must be strictly observed.

The lamp is run at high pressure and temperature. It emits a considerable quantity of ultra-violet light.

- It must not be handled when hot or viewed directly when lit.
- The lamp must be switched off and allowed to cool for at least half an hour before being handled.
- A protective headguard with visor, and gauntlets, must be worn when handling the lamp. Use of gauntlets will also prevent contamination of the quartz envelope of the lamp by finger grease.
- A plastic safety cylinder must be placed around the lamp when it is to be removed from or replaced in the lamphouse.

6.3.3 Replacement of a Failing Lamp

1. Switch off the analyse **SCANNER** switch. Remove the bottom left-hand front panel of the analyse unit to gain access to the xenon lamp supply.
2. Switch off the lamp by means of **two** switches. One is on the operator control panel, the other is on the XLS front panel. (Switch marked **MAINS ON**.)

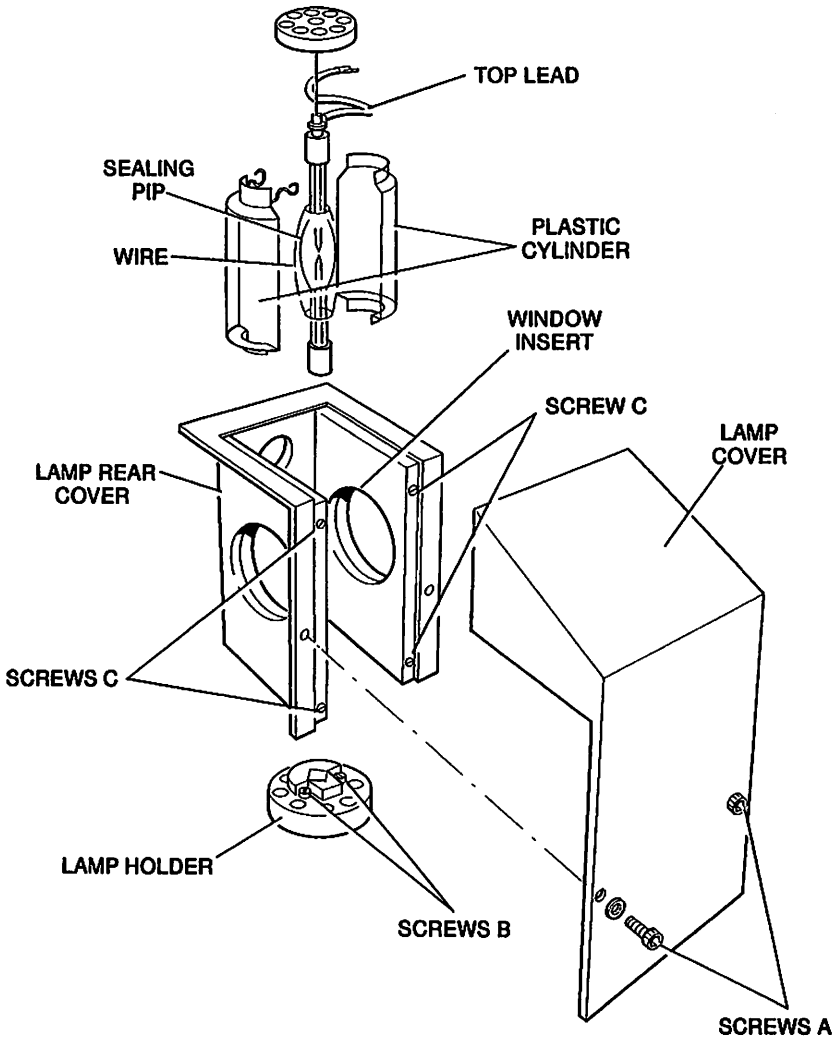


Figure 6.1 Xenon Lamp Assembly

3. Allow half an hour for the lamp to cool.

WARNING

Before proceeding with the next Step, put on the headguard, visor and gauntlets.

4. Use the Allen-key driver to remove the two screws 'A' in Figure 6.1. Take off the lamp cover.
5. Place the two halves of the plastics cylinder around the centre of the lamp and secure with the spring clips.
6. Taking care not to knock the lamp, pull the top lead off the tag behind the lamp. The wrench from the tool kit may be used (slip-joint pliers, 9990-4013).
7. Loosen two screws 'B' with the Allen-key driver (9990-3411), whilst holding the lamp steady in its plastic cylinder. Remove the lamp and place it on a working surface.

CAUTION

Do not twist the lamp when removing or replacing the top lead.

8. Hold the positive, metallic end of the lamp with one wrench and unscrew the top connector with the other wrench. Remove the lamp top lead. Place the lamp in its protective box.
9. Inspect the top lead. The insulation will have deteriorated in use. If the insulation is in poor condition, the lead should be replaced. If the insulation is in good condition, then inspect the ring terminal at the lamp end of the top lead. Clean the terminal with fine emery cloth if necessary, to ensure good electrical contact when replaced on the new lamp.
10. Take a new lamp with its protective plastic cylinder in place. Fit the top lead to the end of the lamp marked + (positive end). Hold this end firmly with one wrench whilst tightening the top connector with the other wrench.
11. With the plastic cylinder still in place, fit the lamp into the lamp base. Make sure that:
    - The positive terminal is uppermost.

- The lamp sealing pip is facing the back of the lamphouse.

Tighten two screws 'B' with the Allen-key driver, whilst holding the lamp steady in its plastic cylinder.

12. Fit the top lead to the tag behind the lamp. Remove the spring clips and two halves of the plastic cylinder from around the lamp.
13. Replace the lamp cover and secure with two screws 'A'.

CAUTION

Damage to the electronics unit may result if the lamp is switched on when the scanner is on.

14. Ensure that the **SCANNER** switch on the control panel is still off.

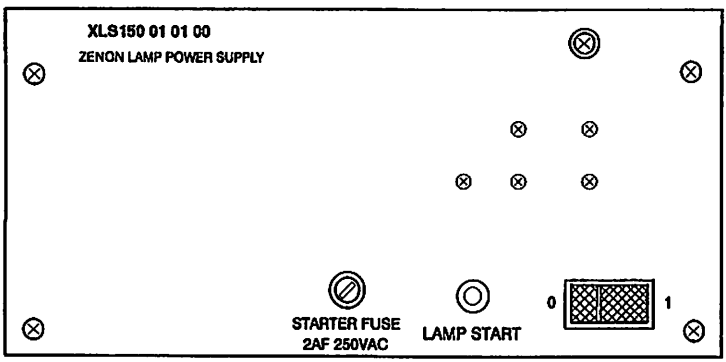


Figure 6.2 XLS Front Panel

15. Switch on the lamp as follows:
    a) Operate the **LAMP** switch on the operator control panel.
    b) Switch the **MAINS ON/OFF** switch on the XLS front panel to on.
    c) Momentarily depress the **LAMP START** push-button switch on the XLS front panel. Do not keep the switch depressed, as this may cause damage to the XLS.

The lamp starter will make a noise for about one second, after which the lamp should light. The **MAINS ON** indicator lamp should also light. If the lamp does not light, press the button again, after waiting at least five seconds. Repeat until the lamp lights. Most lamps light the first time but some may require two or even three attempts, especially when cold and/or new. If the lamp fails to light, turn off the **LAMP** switch on the control panel. Check that the lamp is correctly fitted.

16. When the lamp lights, switch on the **SCANNER** switch on the control panel.
17. Thirty minutes after the lamp has lit, adjust the lamphouse optics controls to achieve optimum light output.
18. The luminous intensity of a new lamp will change rapidly during its first half-hour of life, with a slower variation during the next two or three hours. After two days, its intensity will become stable. Repeat the lamphouse adjustment every few hours until the lamp is stable.
19. In many countries the xenon lamps are guaranteed for 1,000 hours. If they fail before this time a refund can be obtained on receipt of the failed lamp in its original packaging. Hence the packaging of a new lamp should be kept in case of premature failure. It is suggested that the packaging be placed in the front right-hand vertical member of the frame.

WARNING

The protective headguard with visor and the protective gloves must be worn when performing the following procedure. The lamp, is highly pressurized.

20. The old lamp should be destroyed in the following manner. It should be placed in a thick cardboard box or Jiffy bag and smashed with a hammer.
21. Align the analyse head.

6.4 ROUTINE MAINTENANCE

The execution of certain regular procedures will help to maintain first-class scanner performance. They are described below.

6.4.1 Daily

Check that the two cooling fans mounted together on the rear panel of the analyse unit are operating.

6.4.2 Weekly

Adjust the lamphouse optics.

Clean the inside of the analyse cylinders with anti-static fluid.

Clean the analyse lens with a cotton bud and some lens cleaner.

Inspect the centre optics lenses. Should the collars be found to be loose, contact Crosfield Electronics.

Lubricate the leadscrew: apply one drop of Maccurat-32 oil at each end of the leadscrew and one drop in the middle.

CHAPTER 7

FAULTFINDING

CONTENTS

Section		Page
7.1	FAULTFINDING CHART	7-1
7.2	OPERATOR ERROR MESSAGES	7-3
7.3	MACHINE FAULT MESSAGES	7-4

CHAPTER 7

FAULTFINDING

7.1 FAULTFINDING CHART

Symptom	Cause
No response from analyse control panel.	Analyse unit switched off.
All readings in Current Value Display very high.	Xenon lamp switched off.
Machine does not autobalance correctly or long autobalance sequence.	1. Xenon lamp switched off. 2. Analyse lens not properly home. 3. Analyse lens in wrong position. 4. Analyse head (spot)misaligned. 5. Incorrect analyse aperture selected. 6. Incorrect scanning lens fitted. 7. Lamphouse alignment controls not set properly. 8. Lamphouse filter knob set incorrectly. 9. Lamphouse window broken. 10. Xenon lamp failing. 11. Dirty portion of clear cylinder being used.
Cylinder Release does not operate for small cylinder.	Cylinder rests down instead of up.
Analyse traverse does not operate with cylinder removed.	Cylinder rests down instead of up.
'Illuminated' buttons do not become illuminated when pressed.	Lamps switched off. Use CAL 0 to switch lamps on.
Random streaks of different expose levels superimposed on separation.	Xenon lamp failing.
Separation film is speckled.	Too much USM Sharp used on grainy original. Threshold set too low.
Separation film shows halos and lines at changes in contrast.	Too much USM Sharp applied.
'VIEW' gives dim illumination.	Reflection copy lamphouse controls not set properly.

Symptom	Cause
Xenon lamp cannot be switched	1. 'LAMP' switch off at operator control panel. 2. XLS switched off. 3. 'LAMP START' button not operated. 4. Lamp cover not fitted properly. (Call the Service Engineer).
Sputtering noise emanates from Lamphouse when 'LAMP START' button is pressed.	This is normal.

7.2 OPERATOR ERROR MESSAGES

Main Function	Error Message	Possible Cause and Solution.
POSITION	POSN ENTRY ERROR	The second Position has not been entered or Position entry is invalid. Perform a Datum search and enter both positions again via 'POSN' function.
FINAL SIZE	O/P TOO WIDE O/P TOO HIGH	The 'ENLARGEMENT' x 'INPUT SIZE' value is greater than that allowed for the current format selection - check 'FINAL SIZE'.
FINAL SIZE	H ERROR! V ERROR!	Output size has been entered to the nearest 0.1 mm. Enter output size as a whole number.
ENLARGEMENT	ENLRGMT INVALID	The 'ENLARGEMENT' value entered is outside the range allowed for the type of cylinder in use - check the valid range of 'ENLARGEMENT' allowed for large and small cylinder.
COLOUR	WRONG COLOUR OR TONAL REGION????	The edit being performed in the selected region is not allowed if the analyse head is not aimed at the selected region - check, in 'VIEW' mode, the region being monitored and then check in which region the edit was requested.
AUTOBALANCE	ERR W:YMC B:YMC	This gives an indication as to the area where 'AUTOBALANCE' has failed. Try 'AUTOBALANCE' again - repeated failure in one or more channels indicates an electronic fault - consult the Service Engineer.
FORMAT	LAYOUT ERROR	A 'FORMAT' selection has been made which is not allowed - check which 'FORMAT' selections are allowed.
EW/EB	EXCESS BLACK	You have made either an EW or an EB entry, using MAN B, that is greater than the normal first printing tone or maximum shadow ink weight for the current BV/CV in use.
USM	I/P OVER RANGE	You have entered a value which is too high, i.e. outside the permitted range. Check the permitted range and re-enter.

7.3 MACHINE FAULT MESSAGES

These messages are only displayed when the scanner is in the scan mode. The machine may be stopped as a result of the fault. The analyse display will show, for example:

83% REM SCR.LIMT

where: 83% REM is the amount of separation yet to be exposed.

and: SCR.LIMT is the ERROR message.

Failure Message	Meaning of Message	Possible Cause
SCR.LIMT	The leadscrew is not moving.	The analyse carriage has overrun. The leadscrew, if turned by hand, will feel disengaged. Turn the screw so that the carriage moves towards the centre. The screw should re-engage. This may be an isolated fault, but report it to Crosfields, especially if the scanner has missed a service.
TMP.LIMT	Leadscrew servo overheating.	Leadscrew requires lubrication or adjustment.
A SPEED	The analyse cylinder has not reached the required speed. Scanning will not start.	If the condition persists or shows on film, inform Crosfield.

CHAPTER 8

REFERENCE DATA

CONTENTS

Section		Page
8.1	ANALYSE SCANNER DATA	8-1
8.1.1	Scanner Fact Chart	8-1
8.1.2	USM Functions and Settings	8-2
8.2	OPERATOR'S CALIBRATION NUMBERS	8-3
8.3	ABBREVIATIONS	8-5

CHAPTER 8

REFERENCE DATA

8.1 ANALYSE SCANNER DATA

8.1.1 Scanner Fact Chart

CYLINDER	ENLARGEMENT	ANALYSE APERTURE	ANALYSE FILTER
	*20 - 80	5	D
LARGE	20 - 40	4	D
(Transmission)	41 - 80	3	C
	81 - 200	2	B
	201 - 800	1	A
LARGE	20 - 40	4	N/A
(Reflection)	41 - 800	3	N/A
SMALL	75 - 299	2	B
	300 - 2000	1	A

*Note: Use only Aperture 5 in range 20 - 80% when scanning subjects with fine edges.

	Front Panel			CAL 508								
	Sharp	Smooth	Black Gain	Threshold	Fringe Clip	D1	D2	Yellow Gain	Magenta Gain	Cyan Gain	Neg Gain	White Attenuator
Average Trans Settings	4/5	3/4	4	5/8	127	150/200	225/255	3/6	1/2	1	1/2	3
Big Enlargements	3/5	2/3	4	5/8	90/127	150/180	200/255	3/6	1/2	1	1	3/5
PCR	3/5	2/3	8/12	5/8	90/127	150/180	225/255	4/6	1/2	1	1	3/5
Fine Detail Sharpness	5/7	2/3	4/8	5/8	70/110	150/180	225/255	5/7	1/2	1	1/3	7/9
Fleshtones	3/5	3/4	4	5/8	90/127	150/180	200/255	4/6	1/2	1	1	3/4
Grainy Originals	2/4	3/6	4	10/15	110/127	150/180	200/255	5/7	2/3	1	1	3
Colour Prints	3/5	2/3	4/8	5/8	80/127	150/180	180/255	3/6	1/2	1	1/2	3
Water Colours	2/4	3/6	1/4	5/10	100/127	100/150	150/200	3/6	1/2	1	1	3

8.2 OPERATOR'S CALIBRATION NUMBERS

The following list of Calibration numbers, including the associated Recall and Store numbers, has been compiled for the use with Magnascan scanner.

Description	Command Access	Recall	Store
Panel Light On/Off	0		
32-Step Calibration	1	101	201
Permanent Tone Boosts	10	110	210
Black Printer Data	11	111	211
Colour Correction	12	112	212
Grey Balance	13	113	213
PCR & UCR	14	114	214
Cast 2		115	215
Cast 1		116	216
Catchlight		117	217
Limits		118	218
EDG Data		119	219
Bottom Density	20)		
Top Density	21)	120	220
Cast Data (Screen)	25)		
Auto EW	27)		
E/W Via Keypad	28		
E/B Via Keypad	29		
All CVs in Use	30	130	230
Single CVs in Use	31		
Single CVs Edited	32		
Picture Distortion	33		
Micro Enlargement	39		
View Scan Spot	40		
Insert A Patch	41		
Insert B Patch	42		
PCR Max Ink %	65		
Load all BVs	199		
Autobalance Targets,			
B Patch Storage	502	152	
Luminosity Values	503	153	253
Print Density Values	504		
Grey Balance Window	506		
USM Variables	508	158	258
Line Mode	509		

Description	Command Access	Recall	Store
Pastel Curve	513	163	263
Black Data	514		
UCR breakpoint and slope	515		
Pastel Mode	516		
PCR - Ink Correction Curve	520)		
PCR - Additivity Factor 1	521)		
PCR - Additivity Factor 2	522)		
PCR - 3 Col Under Black	523)		
PCR - Max Blk Percentage	524)	114	214
PCR - Highlight or Shadow Restriction	525)		
PCR - Colour Correction	526)		
PCR - Highlight Col Modifier	527)		
PCR - Highlight Blk Modifier	528)		
Slow Traverse Speed	882		
Maxim O/P to Disk	895		
Analyse Unit Reset (including JVs)	900		
Analyse Unit Reset (including JVs and CVs)	902		
Initialize	940		
Software Version	999		

8.3 ABBREVIATIONS

ABBREV	: MEANING
AUTOBAL	Autobalance
AN	Automatic Neutralization
AUTO	Automatic Generation
B	Black
BLAK	Black Printer (Block)
BP	Breakpoint /Enter Black
BV	Basic Value
C	Cyan
CAL	Calibrate
CC	Colour Correction
CE	Cancel Entry
CLT	Catchlight
COL	Colour
CST1	Cast 1
CST2	Cast 2
CV	Customer Value
CYL	Cylinder
EB	Enter Black
EDG	Electronic Dot
EW	Enter White
EWEB	Enter White/Enter Black
G	Green
GBAL	Grey Balance
HL	Highlight Correction
JV	Job Value
LAT REV	Lateral Reversal
LMTS	Limits
LUM	Luminosity
M	Magenta
MT	Midtone
NEG	Negative

ABBREV	: MEANING
NTON	Neutral Tone
OPCAL	Output Calibration
ORG	Original
PCR	Polychromatic Colour Removal
POS	Positive
POSN	Position
PSCR	Pastel Boost
PTBS	Permanent Tone Boosts
R	Red
RDY	Ready
REC	Recall
SDT	Scanner Data Terminal
SEP	Separation
SH	Shadow
SL	Slope
UCR	Under Colour Removal
USM	Unsharp Masking
V	Violet
VAC	Vacuum
Y	Yellow